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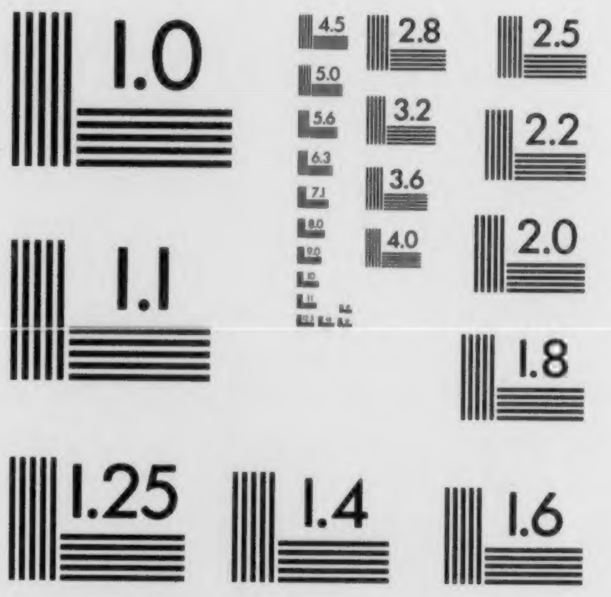

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for

Electric, Gas, and Water Utilities

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ACCOUNTING METHODS AND PROCEDURE
FOR
ELECTRIC, GAS, AND WATER UTILITIES

....

By

W. M. HAMMOND

Chief Accountant, in Charge of Accounts, Statistics, and Finance Divisions of Illinois Commerce Commission; Chairman, Committee on Statistics and Accounts of Public Utilities, National Association of Railway and Utilities Commissioners; Member, Special Subcommittee to Prepare Uniform Accounting Systems for Electric, Gas, and Water Utilities; Member, Advisory Committee on Railroad Valuation, Railway and Utilities Commissioners.

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PREFACE

This treatise is concerned with uniform systems of accounting for public utilities of three classes, namely, (1) electric light and power companies, which will be referred to as "electric utilities"; (2) gas companies, being those distributing manufactured gas, which will be referred to as gas utilities"; and (3) companies operating water-supply systems, which will be referred to as "water utilities."

Altho each of these classes requires a schedule of accounts different in some respects from that required by the others, there are many points in which the requirements of an accounting system are the same. It is, therefore, convenient to consider together the principles, methods, and accounting forms, so far as they are substantially the same in all three classes.

The term "uniform system of accounting" when used in connection with public utilities usually refers to a system of accounts prescribed by a state commission and required to be used by all utilities of a given class operating within a state and subject to the jurisdiction of such commission. These systems of accounts are also frequently called "classifications of accounts" or, briefly, "classifications." They will be so referred to in this treatise.

Any system of accounts that is to be statewide in its application to a given class of public utilities must of necessity be adaptable to a wide range of conditions. The small town electric-light plant in which the townspeople invest a few hundred dollars, and the electric light and power plant serving the diverse needs of a large city or great industrial area, having investments of over one hundred million dollars, with its owners in all parts of the country, presents widely different accounting requirements. To meet these conditions, if uniformity is to be secured, the accounting system must be so devised that by contracting or expanding the basic groups the same accounting structure may fit the requirements of all.

Many public-utility companies operate different classes of utilities, such as electric and gas, or various other combinations of two or more classes. Frequently electric railways and central station heating plants are operated in connection with electric utilities. This joint operation introduces many complex problems involving the allocation of costs, which make it most desirable that the general structure of the classifications of accounts for all of these classes of utilities be as nearly alike as may be permitted by the nature of the business and the conditions under which it is conducted.

In the matter presented herein no attempt has been made to deal with the general accounting principles which are common to all types of business enterprises. Accounting principles are discussed only in cases where they should be given special consideration in electric, gas, or water utilities.

Attention will be given to some phases of the public-utility accountant's duties which the author has not found discussed in many of the excellent works on accounting and auditing. Some of the matters considered lie somewhat beyond the field of accounting, being related to statistics, finance, economics, rate making, and other matters growing out of the peculiar relation of public utilities to the public, which place upon the accountant responsibilities requiring an understanding of matters not strictly of an accounting nature.

A rather extended discussion has been entered into in connection with utility rate problems. This has been prompted largely by the author's observations of the manner in which information has frequently been presented to regulatory commissions in connection with cases involving rate making. Frequently the information presented in such cases is so incomplete, or presented in such a confused manner, that it is difficult for the commission to render a decision based upon a comprehensive understanding of the facts.

W. M. HAMMOND.

CONTENTS

Page No.

CHAPTER I. State Regulation of Public Utilities.................. 1

" II. Balance Sheet Accounts.................................. 11

" III. Income and Expense Accounts............................ 23

" IV. Capital and Revenue Expenditures........................ 51

" V. Depreciation and Retirement of Property.................. 66

" VI. The Utility Rate Problem................................ 157

" VII. Financing Public Utilities............................. 235

" VIII. Accounting for Municipal Water Works.................. 281

" IX. Statistics.. 289

" X. Accounting Methods and Procedure.......................... 303

" XI. Increasing Importance of Public-Utility Accounting..... 335

APPENDIX A. Accounting Forms and Records......................... 347

" B. Annual Report of an Electric Utility...................... 361

" C. References to Literature on Public Utilities.............. 409

DETAILED OUTLINE OF CHAPTERS

CHAPTER

I - STATE REGULATION OF PUBLIC UTILITIES

Page
Characteristics of the Public-Utility Business........................ 2
Economic Importance of Public Utilities........................ 3
Corporate Form of Organization........................ 4
State Regulation of Public Utilities........................ 4
Accounting Systems Prescribed by Commissions........................ 5
Necessity for National Uniformity of Classification........................ 6
Advantages of National Uniformity........................ 7
Adoption of Uniform System of Accounts by States........................ 8

II - BALANCE-SHEET ACCOUNTS

Explanation of Balance-Sheet Accounts........................ 12
Fixed Capital........................ 13
Prepayments........................ 16
Investments in Affiliated Companies........................ 16
Replacement Fund........................ 16
Property Abandoned........................ 16
Jobbing Accounts........................ 17
Clearing and Apportionment Accounts........................ 17
Work in Progress........................ 17
Reacquired Securities........................ 18
Treasury Securities........................ 18
Long-Term Debt........................ 18
Receivers' Certificates........................ 19
Consumers' Deposits........................ 19
Retirement Reserve........................ 20
Casualty and Insurance Reserve........................ 20
Contributions for Extensions........................ 21
Miscellaneous Unadjusted Credits........................ 21
Profit and Loss Balance........................ 21

III - INCOME AND EXPENSE ACCOUNTS

The Income Account........................ 24
Operating-Revenue Accounts........................ 38
Operating-Expense Accounts........................ 40
Operating Expenses Classified as to Operating Functions........................ 41
Production Costs........................ 42
Transmission, Storage, and Distribution........................ 43
Utilization Expense........................ 44
Commercial Expense........................ 44
New Business Expense........................ 45
General and Miscellaneous Expense........................ 46
Operating-Expense Accounts Adapted to Both Large and Small Companies........................ 47

IV - CAPITAL AND REVENUE EXPENDITURES

Consideration of Construction and Operation Costs Important........................ 52

Page
Importance of Separation of Capital and Revenue Expenditures........... 53
Cost of Supervising Additions and Betterments.......................... 55
Capitalization of Unproductive Property................................ 56
Accounting for Additions and Betterments............................... 58
Rule for Capitalizing Replacements..................................... 59
Taxes during Construction.. 60
Salvage from Construction Equipment, Tools, and Materials.............. 60
Improvements on Leased Property.. 60
Discount on Bonds Chargeable to Capital Account........................ 61
Projects Abandoned... 62
Capitalization of Limited-Period Franchises and Rights................. 63

V - DEPRECIATION AND RETIREMENT OF PROPERTY

Depreciation Contrasted with Decline in Market Values.................. 67
Relation of Depreciation to Capital and Income......................... 67
Retirement Expense Substituted for Term, "Depreciation"................ 69
Depreciation Charges as Advance Payment on Maintenance Costs........... 70
Purpose of Depreciation or Retirement Expense Charges.................. 73
Depreciation as Related to Efficiency of Operation..................... 73
Depreciation as Related to Investment Values........................... 75
Methods of Computing Depreciation or Retirement Expense Charges........ 77
Straight-Line Method... 78
Sinking-Fund Method.. 81
Straight-Line Method Illustrated....................................... 83
Sinking-Fund Method Illustrated.. 84
Rate of Return Affected by Investment of Depreciation Funds............ 86
Retirement Loss Equalization Method.................................... 87
Retirement Reserve... 88
Retirements Chargeable to Future Operations............................ 92
Extent to Which Retirement Losses Should Be Anticipated................ 97
Decisions of Courts Relating to Depreciation or Retirement Losses...... 100
Position of Utility Operators on Treatment of Retirement Losses........ 108
Electric Light and Power Companies..................................... 112
Electric-Railway Companies... 113
Steam-Railway Companies.. 114
Water-Supply Companies... 115
Gas Companies.. 116
Treatment of Retirement Losses by Regulatory Commissions............... 117
Combination of Maintenance and Retirement Expense...................... 130
Business Considerations Affecting the Provision Made for Depreciation.. 133
Permanency of Public-Utility Industry.................................. 134
Unity of the Public-Utility Enterprise................................. 135
Reserves Based on Elapsed-Life Theory Not Needed....................... 139
Investment Not Made Secure by Reserves on Elapsed-Life Theory.......... 140
Status of Depreciation Reserves Invested in Plant...................... 143
Summary of Discussion.. 144

VI - THE UTILITY RATE PROBLEM

The Rate-Making Situation.. 158
Order of Procedure in a Rate Case...................................... 159

Page
Valuation Investigation.......... 160
Cost of Operation.......... 160
Gross Revenue and Income.......... 160
Consumer Statistics and Rate Schedules.......... 161
Value for Rate-Making Purposes.......... 161
Factors Requiring Consideration in a Valuation.......... 164
Original Cost and Reproduction Cost.......... 165
Opinions of Courts on Present Fair Value and Original Cost.......... 167
Commissions Guided by Court Decisions When Possible.......... 169
Summary of Cases Showing Basis of Valuation.......... 171
Views of Public Utilities on Reproduction Cost.......... 171
Possible Effects of Reproduction-Cost Valuations on Investors.......... 172
Excess Cost of Replacements.......... 173
Current Prices of Material and Labor Considered.......... 175
Capitalizing Excess Cost of Replacements Illustrated.......... 176
Existing Depreciation.......... 177
Corporate History.......... 179
Cost of Structural Units.......... 180
Insufficient Records.......... 180
Gifts, Grants, and Donations.......... 182
Property Not Used and Useful.......... 183
Property Owned but Not Used.......... 184
Property Used but Not Owned.......... 186
Property Acquired from Income or Surplus.......... 187
Going Value.......... 188
Valuation of Working Capital.......... 193
Apportionment of Property between Different Departments.......... 196
Rate of Return.......... 197
Cost of Operation.......... 201
Determination of Cost of Operation.......... 201
Cost of Different Classes of Service.......... 204
Apportionment of Steam-Production Cost.......... 208
Apportionment of Supervision, General Expenses, and Taxes.......... 216
Statistics of Production and Unit Cost.......... 217
Explanation of Cost Statements.......... 219
Consumer Statistics.......... 220
Explanation of Electrical-Consumers' Statement.......... 224
Explanation of Gas-Consumers' Statements.......... 228

VII - FINANCING PUBLIC UTILITIES

Public-Utility Security Issues Classified.......... 236
Discount and Premium on Capital Stock.......... 242
Accounting for Bond Discount and Premium.......... 244
State Regulation of Security Issues.......... 246
Short-Term Notes.......... 248
Capitalization of Intangible Capital.......... 249
Commission May Make Valuation of Property.......... 250
Purchase of a Plant in Operation.......... 252
Values for Capitalization Not Same as for Other Purposes.......... 253
Investigation of Accounting for Replacements.......... 255
Capitalization in Case of Merger or Consolidation.......... 255

Page
Securities Issued for Working Capital 258
Capitalization of Interest during Construction 258
Mortgage Bonds 261
Mortgage or Deed of Trust 262
Provisions for Fortifying Security of Bonds 263
Accounting for Sinking Funds 264
Operation of Sinking Fund 266
Serial Maturities of Bonds 268
Proportion of Stock and Bonds 270
Simplicity of Financial Structure Desirable 274
Commission Regulation Co-operative 276
Customer Ownership of Securities 277
Holding Companies 278

VIII - ACCOUNTING FOR MUNICIPAL WATERWORKS

Comparisons with Privately-Owned Waterworks 282
New England Waterworks Association Classification 283
Form of Operating and Income Statement 284
Condensed Balance Sheet Accounts for Self-Supporting Waterworks 286

IX - STATISTICS

Value of Statistics 290
Accounting System to Provide for Preparation of Statistics 291
Necessity for Study of Operating Efficiency 292
Customers Statistics Report 293
Demand for Special Reports 296
Reports Required by State Commissions 296

X - ACCOUNTING METHODS AND PROCEDURE

Scope of Accounting Procedure 304
Form of Organization 304
Books of Accounts, Records, and Forms 305
Journals 307
Voucher System 308
General Ledger 309
Accounting for Sales 309
Meter-Reading Cards 310
Consumer's Bill and Ledger 310
Billing by Machine Compared with Billing by Hand 311
Machine-Billing Routine 312
Record of Customers' Deposits 317
Operating Ledger 318
Time Reports and Pay Rolls - Medium-Sized Utility 319
Time Reports and Pay Rolls - Large Utility 320
Outside Employes 320
Inside Employes on Hourly Rate 321
General Office and Other Monthly Rate Employes 321
Distribution of Charges and Balancing of Pay Rolls 322
Pay Roll 323

Page
Cash Receipts.. 324
Cash Disbursements... 326
Work-Order Ledger.. 326
Fixed-Capital Accounts Ledger.. 327
Determining the Original Cost of Retired Property.................... 327
Removal of Retired Property from Fixed Capital....................... 329
Stores-Department Records.. 330

XI - INCREASING IMPORTANCE OF PUBLIC-UTILITY ACCOUNTING

Changes in Legal and Economic Status of Public Utilities............. 336
Changes in Accounting Methods.. 337
Law of Supply and Demand Not Completely Operative.................... 338
Recognition of Standards of Procedure in Rate Making................. 339
Status Regarding Depreciation.. 340
Informing the Public on Financial Matters............................ 344

LIST OF ILLUSTRATIONS.

Figure 1 - Comparative Balance Sheet, Showing Standard Form.......... 14
Figure 2 - Fixed-Capital Accounts.......... 14-15
Figure 3 - Standard Form of Income Account.......... 26
Figure 4 - Operating-Revenue Accounts.......... 27
Figure 5 - Operating-Expense Accounts.......... 28
Figure 6 - Revenue and Expenses per Unit of Electrical Energy Produced and Distributed.......... 218
Figure 7 - Revenue and Expenses per Unit of Gas Produced and Distributed.......... 221
Figure 8 - Revenue and Expenses per Unit of Water Pumped and Delivered.......... 222
Figure 9 - Tabulation of Electric-Consumers' Bills.......... 225
Figure 10 - Tabulation of Gas-Consumers' Monthly Bills.......... 229
Figure 11 - Comparison of Financial Structures.......... 275
Figure 12 - Fuel Statement Measuring Efficiency of Generating Plant... 294
Figure 13 - Consumers Statistics Report.......... 295
Figure 14 - Statistics of Operations for an Electric Utility.......... 297
Figure 15 - Statistics of Operations for a Gas Utility.......... 298
Figure 16 - Statistics of Operations for a Water Utility.......... 300
Figure 17 - Organization Chart of an Electric Utility.......... 306
Figure 18 - Reports on Customers, by Districts.......... 316

LIST OF FORMS.

Form 1 - Journal Voucher.......... 348
Form 2 - Electric-Light Meter-Reading Card.......... 348
Form 3 - Gas Meter-Reading Card.......... 348
Form 4 - Electric-Light Bill.......... 349
Form 5 - Consumer's Ledger Page.......... 349
Form 6 - Recapitulation of Sales.......... 349
Form 7 - Deposit Receipt Book.......... 350
Form 8 - Customer's Deposit Record.......... 350
Form 9 - Operating Ledger Account.......... 351
Form 10 - Daily Time Report.......... 352
Form 11 - Summary of Daily Time Reports.......... 352
Form 12 - Pay Roll.......... 352
Form 13 - Daily Time Report.......... 353
Form 14 - Employe Rate Record.......... 353
Form 15 - Pay Roll or Register of Pay-Roll Checks.......... 353
Form 16 - Cash-Receipts Record.......... 354
Form 17 - Bank Register or Record of Cash Disbursements.......... 354
Form 18 - Investment Ledger Sheet.......... 355
Form 19 - Fixed-Capital-Account Ledger Sheet.......... 356
Form 20 - Estimate of Material and Labor.......... 356
Form 21 - Property-Retired Ledger Sheet.......... 357
Form 22 - Details of Property Retired.......... 357
Form 23 - Schedule of Stores Invoices.......... 358
Form 24 - Supply Ticket.......... 358
Form 25 - Recapitulation of Supply Tickets.......... 359
Form 26 - Schedule of Supply Tickets for Operating and Investment Accounts.......... 360
Form 27 - Stock Record.......... 360
Form 28 - Schedule of Bills Rendered.......... 361

CHAPTER I

STATE REGULATION OF PUBLIC UTILITIES

....

The essential points brought out in this section are briefly summarized in the following:

1. There are problems peculiar to the public-utility business, on account of its intimate relation to the general interests of the public.
2. Our whole economic development is absolutely dependent upon public utilities.
3. To insure adequate service to the public at fair rates, public utilities are subject to governmental regulations in nearly every state in the Union.
4. The National Association of Railway and Utilities Commissioners, an organization of the state commissioners of the states, has formulated and approved uniform classifications of accounts recommended for use in all states.
5. A majority of the states have adopted the uniform classifications of the national association.
6. National uniformity of classification has many advantages, among which are a more clearly defined terminology, a readier means of comparing financial statements, and various economies in connection with accounting procedure.

STATE REGULATION OF PUBLIC UTILITIES

Characteristics of the Public-Utility Business.- The public-utility business is, in important characteristics, different from other industries. The character of the operating processes and the necessity for continuous service of uniform quality, with capacity to meet the instant demand on productive facilities having little, if any, storage capacity, present problems peculiar to the public-utility business.

Another matter of great significance is the intimate relation of the public utility to the general interests of the public. In ordinary business enterprises, prices are regulated by competition, and the consumer has little concern with the underlying facts on which prices are based. He buys where he can buy cheapest, quality considered, or possibly he refrains from purchasing until prices are more to his liking. But the consumer cannot obtain public-utility service thru a competitor of the company serving him, nor can he well go without the service or postpone taking it.

For these reasons, and others, among which is the necessity for the use of public streets by the utility, the public, acting under the police powers of the several states, has asserted authority to regulate the prices or rates charged for public-utility service, as well as the conditions of service. Practically, every inhabitant within the territory served by the utility is a daily user of the service in one form or another. The public utility is not merely an organization of capital for private profits, but is a great institution assuming an obligation to serve all alike to the limit of their needs.

Economic Importance of Public Utilities. - The investment in public utilities in the United States is estimated at about eighteen billion dollars, the largest investment in any single industry except the railroads, which, of course, are public utilities, but we use the term in its restricted sense applying to all utilities other than railroads. This is almost twice the investment in the iron and steel industry, which is the next largest.

The electric light and power business represents an investment of nearly six billion dollars. Gas companies have an investment of approximately four billion, while the street and interurban railway investment is about five billion, and the telephone business represents more than two billion of investment. Large investments are also represented by the water companies, bus lines, heating companies, and a few other classes of public utilities.

Probably no single major industry in the United States has such a wide diversification in its investors or so many of its employes and customers-owners of its stocks and bonds. Insurance companies, banks, and trust companies own about two billion dollars of public-utility securities. The laws governing investments in savings banks in most states permit the purchase of high-grade utility bonds by such institutions. These facts point to the wide public interest in the industry and its tremendous importance in the economic scheme of the country.

These facts, however, by no means measure the economic status of the public-utility business, for our whole economic development, including various lines of industry and commerce, with investments in the aggregate vastly greater than the public-utility investment, is absolutely dependent upon the public utilities.

Corporate Form of Organization.- The public-utility organization is usually in corporate form. Practically all corporations are created under state laws, and such laws provide certain rules, in accordance with which the corporate activities must be carried on. While matters relating to corporation law are not within the scope of this discussion, it may be suggested that as the records of the corporation must be kept so as to conform with the laws under which it is incorporated, it is important that accountants who assume responsibility for the company's records be familiar with the general laws governing corporations and the franchise grants, as well as the special laws relating to public utilities of the state or states in which the company does business.

State Regulation of Public Utilities.- In nearly every state of the Union public utilities are subject, not only to the general corporation laws, but also to governmental regulation, exercised thru a commission or board as an agency of the state government. These commissions are designated "Public Service Commission" in sixteen states, and "Public Utilities Commission" in thirteen states. In other states, as in Wisconsin and California, the Railroad Commission has been given jurisdiction over all public utilities. In Illinois, the commission is known as the Illinois Commerce Commission, while in other states are found different names. The extent of the authority delegated to these commissions by the states varies considerably. In many states the commission has authority over rates, service, capitalization, security issues, accounting, franchise provisions, and other matters in which the public is deemed to have a special interest.

While regulation of this character finds its chief justification in the need for insuring adequate service at fair and reasonable rates to all customers or patrons without discrimination or favor, it was early recognized that effective control over rates and service could not be established without control of accounting methods and publicity of facts obtained thru such control. These relations of the public utility to regulatory bodies naturally emphasize the important relations of the accounts to the economic questions involved in the determination of property values, fair rate of return on invested capital, and the distribution of the burden of providing the necessary revenues, involving the many complicated questions of rate making.

Accounting Systems Prescribed by Commission.- Under the laws creating state public-utility or public-service commissions, such commissions are given power to establish a uniform system of accounts to be kept by public utilities, or to classify public utilities and establish a uniform system of accounts for each class and to prescribe the manner in which such accounts shall be kept. They may also, in their discretion, prescribe the forms of accounts, including records of service as well as accounts of earnings and expenses and any other forms and records which, in the judgment of the commission, may be necessary to carry out the provision of the act regulating public utilities.

Development of National Uniform-Accounting System.- An examination of the earlier accounting systems prescribed by the commissions of the several states reveals a lack of uniformity of classification and procedure and some differences in principle. This condition was due partly to differences in state laws, which in some states conferred broader regulatory powers than in other states, and partly to the fact that the state commissions had not devised a plan for co-operation as between the states. The national associations of some of the utilities had formulated and approved classifications of accounts intended for general use by their member companies in the several states, but these associations had no means of securing general adoption of their classifications.

The National Association of Railway and Utilities Commissioners (which is composed of the members of the several state commissions), realizing the advantages of uniformity in accounting practices and in financial statements, at its annual meeting in 1919 instructed its Committee on Statistics and Accounts of Public Utilities, of which the author has been a member for several years, to prepare and submit a report on the subject of a uniform system of accounts for electric and gas companies. This committee submitted to the association at its meeting in Washington, D. C., in November, 1920, the uniform classifications of accounts for electric and gas utilities, which were adopted by the National Association of Railway and Utilities Commissioners in the same year. The following year a uniform classification of accounts for water companies was drafted by the committee and adopted by the Association. These classifications were revised to some extent and again approved at the annual meeting of the Commissions at Detroit, in 1922.

Advantages of National Uniformity. - The advantages of national uniformity in public utility accounting are many. Some of these may be briefly stated as follows:

1. Uniform terminology prevents misunderstanding and confusion in discussions relating to public utilities.
2. A comparison of figures in financial, operating, and other statements is made easier and of greater value.
3. Greater economy is secured thru the elimination of wasteful duplication of forms and records by utilities operating in more than one state. Likewise much time and labor of accountants and others is saved, since they do not have to keep in mind and use more or less conflicting accounting methods and rules.

National uniformity in accounting matters will be beneficial to the regulatory authorities, to the industries regulated, and to investors and the public who may have occasion to investigate the financial conditions associated with public-utility affairs. When all concerned are assured that the titles, "fixed capital," "operating revenues," "operating expenses," "operating income," have a like significance wherever and whenever used, and that reports of transactions occurring in any part of the United States may be compared, with the assurance that they embody a uniform and orderly statement of facts, a confidence will be engendered in the minds of all that the business is carried on upon a sound financial basis.

State Adoption of Uniform System of Accounts.- The National Association of Railway and Utilities Commissioners has recommended the adoption of the uniform system of accounts for electric, gas, and water companies, as prepared by its committee on statistics and accounts. The regulatory commissions in the following states have adopted the uniform classification of accounts for electric-utility companies and in most of these states they have adopted the uniform classification of accounts for gas companies.

Alabama
Arkansas
Arizona
Colorado
Connecticut
Georgia
Idaho
Illinois
Indiana
Kansas
Maine
Massachusetts
Michigan
Nevada
New Jersey
New York
North Dakota
Oregon
Tennessee
Utah
Vermont
Virginia
Washington
West Virginia
Wisconsin
Wyoming

In nine states the regulatory commission does not have jurisdiction over the accounts of electric light and power companies, or gas companies, these states being Florida, Iowa, Kentucky, Minnesota, Mississippi, Nebraska, New Mexico, South Carolina, and Texas. Delaware does not have a state regulatory commission.

The states of Louisiana, Maryland, Missouri, Montana, New Hampshire, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, and South Dakota, have not yet adopted these classifications. Neither has the District of Columbia adopted them. In California, the classification of accounts promulgated by the Federal Power Commission has been adopted.

In several of the states having no regulatory commission the larger companies have voluntarily adopted the classification of accounts recommended by the National Association of Railway and Utilities Commissioners. In some of the states in which these classifications have not been formally adopted by the commission, the commission has, nevertheless, entered orders authorizing their use by various companies. Present indications are that it will not be a great while until practically all of the state commissions will have adopted the classifications of the National Association of Railway and Utilities Commissioners, with such modifications as may be necessary to meet local conditions.

For this reason, these classifications are presented in this treatise as the basis of this discussion of public-utility problems. The accounts are shown in the following:

Figure 1. Balance-Sheet Accounts
Figure 2. Fixed-Capital Accounts
Figure 3. Income Account
Figure 4. Operating-Revenue Accounts
Figure 5. Operating-Expense Accounts

If complete texts of the accounts are desired, showing full information in regard to the composition of the accounts in these classifications, the reader may obtain copies of the uniform classification of accounts from state commissions which have adopted them.

Reader's Test of Subject Matter in Chapter I

The following questions are given to enable the reader to check himself as to his grasp of the important points discussed under the subject "State Regulation of Public Utilities."

1. What are the principal factors which distinguish public utilities from other types of industries?

2. Discuss the economic important of public utilities.

What are the controlling factors in the administration and operation of public utilities?

4. Why is it desirable to have a national uniformity of classifications of accounts?

5. Outline the progress made toward national uniformity of account classifications.

CHAPTER II

BALANCE-SHEET ACCOUNTS

....

The essential points brought out in this section are briefly summarized in the following:

1. By balance-sheet accounts are meant those titles under which the ledger accounts are combined and summarized to show the assets, liabilities, and surplus or deficit at a given time.
2. An actual balance sheet of an electric light and power company is illustrated, to show the balance-sheet accounts and their groupings, as approved by the National Association of Railway and Utilities Commissioners.
3. Fixed capital consists of intangible and tangible property employed in the business. A chart is presented showing in parallel columns the accounts for each of the three classes of utilities.
4. Discussion of various balance-sheet accounts.
5. The profit and loss account is the connecting link between the income account and the balance sheet.

BALANCE-SHEET ACCOUNTS

Explanation of Balance-Sheet Accounts.- The balance-sheet accounts shown in Figure 1 are the same in each classification for electric, gas, and water utilities. This is necessary in a classification of wide application, as it must be used by many companies operating two or more utilities, and it is, of course, not feasible to set up balance-sheet accounts of different form for each utility or attempt to split many of the accounts.

Those assets and liabilities which it is desirable to show in more detail may be carried in subaccounts. For instance, there is one controlling account for materials and supplies for all utilities. This includes many subaccounts, which may be so designed as to keep separate, so far as practicable, the materials for the use of different utilities, as well as to show separately different classes of materials used by a single utility, as, for example, poles, wire, and insulators.

The specific subaccounts to be kept are not provided in the classification. It is expected that each company will keep as many subaccounts and of such character as its business may require.

Many of the accounts shown in Figure 1 do not need any explanation, because they are similar in their general characteristics to those of other types of business. There are, however, some accounts in this classification that require comment, such as:

101. Fixed Capital.
117. Prepayments.
121. Investments in Affiliated Companies.
124. Replacement Fund.
132. Property Abondoned.
133. Jobbing Accounts.
134. Clearing or Apportionment Accounts.
135. Work in Progress.
142. Reacquired Securities.
143. Treasury Securities.
211. Long-Term Debt.
212. Receivers Certificates.
223. Consumers' Deposits.
251. Retirement Reserve
252. Casualty and Insurance Reserve.
255. Contributions for Extensions.
261. Miscellaneous Unadjusted Credits.
270. Profit and Loss Balance.

Fixed Capital.- The permanent investment in utility plant and facilities is designated as "fixed capital." Separate controlling accounts are required for each utility, as -

Fixed Capital - Electric.
Fixed Capital - Gas.
Fixed Capital - Water.

This means that a company operating all of these classes of utilities would have three controlling accounts for fixed capital. Each of these controlling accounts has a large number of subsidiary accounts, frequently referred to as "primary" accounts, as shown in Figure 2.

Tangible Capital covers all physical property classed as fixed capital. Charges to specific accounts for tangible property cover direct labor and material costs up to and including the time of the foreman supervising the job; also such overhead expenditures for engineering, taxes during construction, etc., as can be allocated to definite items of

ILLINOIS ELECTRIC LIGHT AND POWER COMPANY
COMPARATIVE BALANCE SHEET

January 1, 1924 and December 31, 1924

Balance at Beginning of Year	ASSETS	Balance at close of year	Increase or Decrease*	Balance at Beginning of Year	LIABILITIES	Balance at Close of year	Increase or Decrease*
$130,005,164.29	101. Fixed Capital	$ 154,277,410.28	$ 24,272,245.99	$ 59,992,800.00	201. Capital Stock	$ 72,000,000.00	$ 12,007,200.00
	CURRENT ASSETS:			00.00	202. Premium on Capital Stock	00.00	00.00
3,593,292.67	111. Cash	4,118,674.80	525,282.13	28,200.00	203. Capital Stock Subscribed	00.00	28,200.00*
33,989.54	112. Notes Receivable	30,560.52	3,429.02*	59,774,000.00	211. Long-Term Debt	89,774,000.00	30,000,000.00
6,295,473.02	113. Accounts Receivable	7,064,614.41	769,141.39	00.00	212. Receiver's Certificates	00.00	00.00
132,788.20	114. Interest and Dividends Rec'd.	196,687.35	63,899.15		CURRENT LIABILITIES.		
00.00	115. Marketable Securities	00.00	00.00	4,500,000.00	221. Notes Payable	00.00	4,500,000.00
3,322,989.58	116. Materials and Supplies	4,499,369.73	1,176,380.15	1,770,156.61	222. Accounts Payable	1,900,904.96	130,748.35
638,602.98	117. Prepayments	734,804.20	96,201.22	850,609.64	223. Consumers Deposits	759,941.26	90,668.38*
00.00	118. Subscribers to Capital Stock	00.00	00.00	62,179.00	224. Matured Interest Unpaid	46,069.50	16,209.50*
229,256.97	119. Miscellaneous Current Assets	259,634.44	30,377.47	13,289.00	225. Dividends Declared	21,510.00	8,321.00
$ 14,246,492.96	Total Current Assets	$ 16,904,345.45	$ 2,657,852.49	539,070.00	226. Matured Long-Term Debt Unpaid	13,770.00	525,300.00*
	MISCELLANEOUS ASSETS:			638,857.27	227. Miscellaneous Current Liabilities	690,573.29	51,716.02
$ 11,133,403.53	121. Investments in Affiliated Co's.	9,740,681.47	$ 1,392,722.06*	$ 8,374,161.52	Total Current Liabilities	$ 3,432,769.10	$ 4,941,392.51*
6,479,352.63	122. Miscellaneous Investments	7,766,442.56	1,287,089.93				
00.00	123. Sinking Funds	00.00	00.00		ACCRUED LIABILITIES:		
00.00	124. Replacement Fund	00.00	00.00	$ 4,199,980.07	231. Taxes Accrued	$ 5,265,095.26	$ 1,065,115.19
2,179,688.65	125. Miscellaneous Special Funds	2,497,992.18	318,303.53	$ 1,059,409.33	232. Interest Accrued	1,432,696.33	373,284.00
623,298.09	126. Special Deposits	88,314.59	534,983.50*	00.00	233. Miscellaneous Accrued Liab.	00.00	00.00
$ 20,415,742.90	Total Misc. Assets.	$ 20,093,430.80	$ 322,312.10*	$ 5,259,389.40	Total Accrued Liabilities	$ 6,697,788.59	$ 1,438,399.19
					241. Advances from Affiliated Co's.	00.00	00.00
	DEFERRED DEBITS:				RESERVES:		
$ 1,729,124.08	131. Unamortized Debit Disc.Exp.	$ 3,222,975.86	$ 1,493,851.78	$ 18,762,362.39	251. Retirement Reserve	$ 20,243,041.09	$ 1,480,678.70
00.00	132. Property Abandoned	00.00	00.00	1,409,977.50	252. Casualty and Insurance Reserve	1,622,828.17	212,850.67
61,467.59	133. Jobbing Accounts	149,281.14	87,813.55	19,522.52	253. Unamortized Premium on Debt.	18,566.36	956.16*
112,661.18	134. Clearing or Apport. Accts.	92,544.95	20,116.23*	00,00	254. Sinking Fund Reserves	00.00	00.00
81,094.61	135. Work in Progress	110,633.64	29,539.03	00.00	255. Contributions for Extensions	00.00	00.00
635,999.30	136. Miscellaneous Deferred Debits	397,571.20	238,428.10*	00.00	256. Contingency Reserve	00.00	00.00
$ 2,620,346.76	Total Deferred Debits	$ 3,973,006.79	$ 1,352,660.03	2,095,186.15	257. Miscellaneous Reserves	$ 2,347,914.01	$ 252,727.86
				$ 22,287,048.56	Total Reserves	$ 24,232,349.63	$ 1,945,301.07
	ADJUSTMENT ACCOUNTS:						
00.00	141. Discount on Capital Stock	$ 00.00	$ 00.00	$ 1,232,181.93	261. Miscellaneous Unadjusted Credits	1,626,473.60	$ 394,291.67
00.00	142. Reacquired Securities	00.00	00.00	10,608,465.50	270. Profit and Loss-Balance	12,703,312.49	2,094,846.99
		($ 15,000,000.00	($ 15,000,000.00				
$ 268,500.00	143. Treasury Securities	(218,500.00	(50,000.00				
$167,556,246.91	TOTAL ASSETS	$210,466,693.32	$ 42,910,446.41	$167,556,246.91	TOTAL LIABILITIES	$ 210,466,693.32	$ 42,910,446.41

* Denotes Decrease.

FIGURE 1 - Comparative balance sheet in Standard Form Approved by the National Association of Railway and Utilities Commissioners. This statement represents the balance sheet in a report submitted to the Illinois Commerce Commission and shows the balance-sheet accounts and the account classification.

FIXED CAPITAL ACCOUNTS

Electric Utilities

FIXED CAPITAL ACCOUNTS

Intangible Fixed Capital:
301. Organization.
302. Franchises.
303. Miscellaneous intangible capital

Tangible Fixed Capital:
311. Land.
    a. Steam power plant land.
    b. Hydro-electric power plant land.
    c. Gas power plant land.
    d. Transmission system land.
    e. Distribution system land.

    f. General office land.

    g. Miscellaneous land devoted to electric operations.
        g.1. Stores department land.
        g.2. General shops land.
        g.3. Transportation department land.
        g.4. Communication system land.
        g.5. Miscellaneous land.

312. Structures:
    a. Steam power plant structures.
    b. Hydro-electric power plant structures.
    c. Gas power plant structures.
    d. Transmission system structures.

    e. Distribution system structures.
    f. General office structures.
    g. Miscellaneous structures devoted to electric operations
        g.1. Stores department structures.
        g.2. General shops structures.
        g.3. Transportation department buildings.
        g.4. Communication system buildings.
        g.5. Miscellaneous buildings.

Generating Plant - Steam:

313. Boiler plant equipment.
314. Prime movers and auxiliaries - steam.
315. Turbo-generator units - steam.
316. Electric plant - steam
317. Miscellaneous power plant equipment - steam

Generating Plant - Hydro-Electric:

318. Reservoirs, dams, and waterways.
319. Roads, trails, and bridges
320. Water turbines and water-wheels.
321. Turbo-generator units - hydro.
322. Electric plant - hydro.
323. Miscellaneous power plant equipment - hydro.

Generating Plant - Gas:

324. Fuel holders, transmitters, and accessories.
325. Internal combustion engines.
326. Electric plant - gas.
327. Miscellaneous power plant equipment - gas.

Transmission and Distribution:

328. Substation equipment.
329. Storage battery equipment.
330. Underground conduits.
331. Poles, towers, and fixtures.
332. Overhead conductors and devices.
333. Underground conductors.
334. Transmission roads and trails.
335. Services.
336. Line transformers and devices.
337. Line transformers and installation.
338. Consumers' meters.
339. Meter installation.

Consumers' Installations:
340. Installations on consumers' premises.
341. Commercial lamps.
342. Street lighting equipment.
343. Electric appliances.
344. General equipment.
    a. Office equipment.
    b. Shop equipment.
    c. Stores equipment.
    d. Transportation equipment.
    e. Telephone, telegraph, and wireless system.
    f. Laboratory equipment.
    g. Miscellaneous equipment
345. Miscellaneous tangible capital.

Overhead Costs and Other Undistributed Items:

351. Engineering and superintendence.
352. Law expenditures during construction.
353. Injuries and damages during construction.
354. Taxes during construction.
355. Interest during construction.
356. Miscellaneous construction expenditures.
357. Fixed capital not classified by prescribed accounts.
358. Cost of plant and equipment purchased.
359. Unfinished construction.

Gas Utilities

FIXED CAPITAL ACCOUNTS

Intangible Fixed Capital:
301. Organization.
302. Franchises.
303. Miscellaneous intangible capital.

Tangible Fixed Capital:
311. Land.
    a. Land occupied by gas works.
    b. Land occupied by outside holder stations.
    c. Rights of way.
    d. Water rights.
    e. General office land.

    f. Miscellaneous land devoted to gas operations:
        f.1. Stores department land.
        f.2. General shops land.
        f.3. Garage land, etc.

312. Structures.
    a. Works and station structures.
    b. Holders.
    c. General office structures.
    d. Miscellaneous structures devoted to gas operations:
        d.1. Stores department structures.
        d.2. General shop structures.
        d.3. Garage structures, etc.
    e.
    f.

313. Boiler plant equipment.
314. Steam engines.
315. Internal combustion engines.
316. Accessory power equipment.
317. Benches and retorts.

318. Water gas sets.
319. Purification apparatus.
320. Accessory works equipment.
321. Mains.
322. Services.
323. Consumers' meters.

324. Consumers' meter installation.
325. Street lighting equipment.
326. Gas appliances.

344. General equipment.
    a. Office equipment.
    b. Shop equipment.
    c. Stores equipment.
    d. Transportation equipment.
    e. Telephone, telegraph, and wireless system.
    f. Laboratory equipment.
    g. Miscellaneous equipment.
345. Miscellaneous tangible capital.

Overhead Costs and Other Undistributed Items:

351. Engineering and superintendence.
352. Law expenditures during construction.
353. Injuries and damages during construction.
354. Taxes during construction.
355. Interest during construction.
356. Miscellaneous construction expenditures.
357. Fixed capital not classified by prescribed accounts.
358. Cost of plant and equipment purchased.
359. Unfinished construction.

Water Utilities

FIXED CAPITAL ACCOUNTS

Intangible Fixed Capital:
301. Organization.
302. Franchises.
303. Miscellaneous intangible capital.

Tangible Fixed Capital:
311. Land.
    a. Source of supply land and water rights,
    b. Pumping station land.
    c. Purification land.
    d. Storage land.
    e. Transmission and distribution land and rights of way.
        e.1. Transmission land and rights of way.
        e.2. Distribution land and rights of way.
    f. General office land.

    g. Miscellaneous land devoted to water operation.
        g.1. Stores department land.
        g.2. General shops land.
        g.3. Garage land.

312. Structures:
    a. Source of water supply structures.
    b. Pumping station buildings and fixtures.
    c. Purification buildings and fixtures.
    d. Reservoirs and stand pipes.

    e. Distribution structures.
    f. General office buildings and fixtures.
    g. Miscellaneous structures devoted to water operations.
        g.1. Stores department structures.
        g.2. General shop structures.
        g.3. Garage structures, etc.

313. Boiler plant equipment.
314. Steam power pumping equipment.
315. Electric power pumping equipment.
316. Gas or oil power pumping equipment.
317. Hydraulic power pumping equipment.

318. Miscellaneous pumping equipment.
319. Purification system.
320. Transmission mains or canals.
321. Distribution mains or canals.
322. Services.
323. Consumers' meters.

324. Consumers meters installation.
325. Hydrants.
326. Fire cisterns, basins, fountains, and troughs.

344. General equipment.
    a. Office equipment.
    b. Shop equipment.
    c. Stores equipment.
    d. Transportation equipment.
    e. Telephone, telegraph, and wireless system.
    f. Laboratory equipment.
    g. Miscellaneous equipment.
345. Miscellaneous tangible capital.

Overhead costs and other undistributed items:

351. Engineering and superintendence.
352. Law expenditures during construction.
353. Injuries and damages during construction.
354. Taxes during construction.
355. Interest during construction.
356. Miscellaneous construction expenditures.
357. Fixed capital not classified by prescribed accounts.
358. Cost of plant and equipment purchased.
359. Unfinished construction.

FIGURE 2 - Fixed Capital Accounts Approved by the National Association of Railway and Utilities Commissioners.

property. Charges to overhead cost accounts, (Accounts 351 to 359, inclusive, Figure 2) should cover only expenditures of this nature which pertain to the enterprise as a whole and cannot be allocated to definite items of property.

Intangible Capital covers organization expenditures, rights, privileges, and other property not physical, such as franchises or patent rights.

So far as possible, overhead costs should be apportioned to particular jobs on items, to the end that each item shall bear its proper share of such cost, and that the entire cost of the item, both direct and overhead, shall be deducted from the fixed-capital accounts at the time of its retirement. Certain overhead costs, however, which clearly pertain to the entire enterprise, such as certain classes of engineering, taxes, interest, etc., should not be apportioned, but retained in the appropriate fixed-capital accounts as part of the investment cost, so long as the enterprise continues under the form in which it started.

In order that the capital accounts shall at all times disclose the cost of all property in service, the cost of retired capital, whether replaced or not, must be credited to the account or accounts in this classification to which such cost was charged when the property was installed.

The cost of retired property credited to the appropriate fixed-capital account, shall be charged to Account No. 251, Retirement Reserve, after deducting the value of salvage, or insurance, that there may be on the retired property. If the total balance in the reserve is not sufficient to cover such loss, the amount of such loss that has not been provided for by the accumulation of a retirement reserve shall be charged to a Suspense Account, No. 132, Property Abandoned, to be amortized in such manner as may be determined.

Prepayments.- This account includes prepaid expenses and is subdivided into the following accounts:

Prepaid Taxes.
Prepaid Rents.
Prepaid Insurance.
Miscellaneous Prepayments.

Investments in Affiliated Companies.- This account includes the ledger value of the accounting company's investment in securities or non-negotiable notes issued or assumed by affiliated companies, and also its investment advances to such companies. Two companies are affiliated if either one controls the policy of the other or if both are subject to the same control. "Investment Advances" are the debit balances in open accounts with affiliated companies not subject to current settlement and interest accrued on such open accounts when such interest is not subject to current settlement. This account is subdivided as follows:

(a) Stocks.
(b) Bonds.
(c) Notes.
(d) Advances.

Replacement Fund.- If the accounting company desires or is required to segregate in a special fund the assets or any part of the assets represented by the retirement reserve, the ledger value of such assets should be included on the balance sheet in this account.

Property Abandoned.- This is a suspense account, which shall include the retirement loss, i. e., the original cost, estimated if not known, plus cost of dismantling, less salvage on property destroyed or abandoned because of replacement, of obsolescense, of an extraordinary casualty, or for any other reason, when such loss has not been provided for in advance thru a sufficient reserve. Amounts thus charged shall be amortized thru annual or more frequent charges over a definitely determined period to such accounts as shall be proper.

Jobbing Accounts. - This account includes the balances in accounts with customers or others for jobbing work not completed at the date as of which the balance sheet is stated. Such accounts, when work is completed and charges made, are cleared by charges to accounts receivable.

Clearing and Apportionment Accounts. - This account includes the balances in accounts maintained to carry temporarily the cost of operating such facilities as garages, stables, storehouses, etc., and also overhead or burden costs, such as it is desirable to apportion over the construction and operating accounts involved.

The charges to operating accounts and the credits to these accounts should be so distributed that the costs for any one year will be absorbed by the transactions occurring during that year.

Work in Progress. - This account includes the total of the balances in open "work order" or "job order" accounts for work in progress, or in suspense accounts to which the cost of construction or maintenance work is temporarily charged, pending its final distribution to the appropriate fixed-capital or operating-expense accounts.

Charges for additions to fixed capital not involving replacements or for improvements which necessitate retirements or reconstruction of existing property when full credits have been made in advance to fixed-capital accounts to cover the ledger cost of property retired may be carried to fixed capital, Account No. 359, Unfinished Construction, shown in Figure 2.

Reacquired Securities.- When securities, whether bonds or stocks, have been actually issued by the accounting company to bona fide holders for value, or after such issue by another corporation has been assumed by the accounting corporation, and after such issue (or assumption) has been acquired by the accounting company under circumstances that require that they shall not be treated as paid or retired, they shall be charged at face value to this account. If the price at which such securities have been reacquired is greater or less than the par or face value, the difference shall be adjusted thru profit and loss or thru the appropriate discount or premium account.

Treasury Securities.- This account includes the par value of securities which have been nominally issued, that is, when certificates are signed, sealed, and placed with the proper officer for sale and delivery.

Long-Term Debt.- This account includes the total par value of all debts except receiver's certificates and advances from affiliated companies, which by the terms of its creation does not mature until more than one year after date of creation. The records shall be kept so that long-term debts of different classes may be separately shown. The most important classification is that based upon the nature of the lien or security, as follows:

(a) Mortgage Bonds, which are secured by a lien on physical property.

(b) Collateral Trust Bonds, which are secured by a lien on securities or other commercial paper.

(c) Income Bonds, which are a lien upon the accounting companies' revenue alone, or, while being a lien on its property and franchises, can claim payment of interest only in case interest is earned.

(d) Equipment Notes or Bonds, which are secured by a lien on specific equipment.

(e) Miscellaneous Obligations, including all long-term obligations not provided for in the four preceding classes, such as notes, unsecured certificates of indebtedness, debenture bonds, real estate mortgages, and other similar obligations maturing more than one year after date of issue.

Receiver's Certificates.- When any receiver, acting under the orders of a competent court, is in possession of the property of a corporation, and under the orders of such court issues certificates of indebtedness chargeable upon such property, the par value of such certificates shall be included in this account.

Consumers' Deposits.- This account includes the amounts deposited with the accounting company by consumers as security for the payment of bills. Deposits refunded are charged to this account and credited to cash, or to Account No. 125, Miscellaneous Special Funds, if a special fund for such deposits is maintained. Deposits applicable to uncollectible or worthless bills should at the close of the fiscal period be credited to the account of the consumer involved and debited to this account.

Retirement Reserve.- To this account are credited such amounts as are charged to the operating-expense account, "Retirement Expense," to cover the retirement loss, represented by the excess of the original cost plus cost of dismantling, over the salvage value of fixed capital retired from service. To this account is also credited such amounts as may be appropriated from surplus for a similar purpose. When any fixed capital is retired from service, the original cost thereof (estimated if not known) should be credited to the proper fixed-capital account and charged, plus the cost of retirement, less salvage, to this account. If the credit balance in this account is insufficient to cover the retirement loss, the excess over the balance contained in the reserve may be charged to Account No. 132, Property Abandoned.

Casualty and Insurance Reserve.- When any admitted liability arises because of loss or damage to the property of others or of injuries to employes or other persons, the amount of the liability may, if not previously provided for by insurance, be charged to the appropriate operating expense or other accounts, and credited to this account. The actual cost of satisfaction of the liability shall be charged to this account when the matter is determined. This account shall also include the amounts charged to operating-expense account, Insurance, to cover self-carried risks.

Contributions for Extensions. - To this account shall be credited contributions in money or property made to the accounting company for the purpose of assuming the burden or any part of the burden represented by the investment necessary for the establishment or extension of services rendered by the company. This covers such items as contributions toward the cost of line extensions in sparsely settled territory made by consumers for the purpose of obtaining the desired service; also grants from municipal or other governmental bodies, and contributions from other sources made with the object of establishing a new service in a community by assuming a part of the investment cost of the enterprise.

Miscellaneous Unadjusted Credits. - This account shall include the amount of credit balances in suspense accounts that cannot be entirely cleared and disposed of until additional information is received.

Profit and Loss Balance. - The profit and loss account is the collective title for a small group of accounts which form the connecting link between the income account and the balance sheet. Its principal function is to explain changes in the corporate surplus or deficit during a given fiscal period. The standard form of profit and loss account approved by the National Association of Railway and Utilities Commissioners, showing figures of one of the large utility companies, is as follows:

PROFIT AND LOSS ACCOUNT
PERIOD ENDED DECEMBER 31, 1924

Balance at Beginning of the Fiscal Period		$10,608,465.50
Balance Transferred from Income Accounts for Fiscal Period		7,552,117.37
501 Dividend Appropriations of Surplus	$5,389,002.00	
502 Appropriations to Reserves		
503 Miscellaneous Credits to Profit and Loss		166,770.59
504 Miscellaneous Debits to Profit and Loss	235,038,97	
Balance at End of Fiscal Period (Shown on Balance Sheet, Figure 1.)	12,703,312.49	
Totals	$18,327,353.46	$18,327,353.46

Reader's Test of Subject Matter in Chapter II

The following questions are given to enable the reader to check himself as to his grasp of the important points discussed under the subject, Balance-Sheet Accounts.

1. What is nature and purpose of the balance sheet?
2. What is meant by fixed capital?
3. Distinguish between tangible and intangible property.
4. How should overhead costs in connection with the construction of property be applied?
5. Explain the nature of the following accounts.
    a. Prepayments.
    b. Investments in Affiliated Companies.
    c. Reacquired Securities.
    d. Treasury Securities.
    e. Replacement Fund.
    f. Property Abandoned.
    g. Retirement Reserve.
    h. Profit and Loss Balance.

CHAPTER III

INCOME AND EXPENSE ACCOUNTS

....

The essential points brought out in this section are briefly summarized in the following:

1. The income account indicates the sources and disposition of income during a given period.
2. Operating revenues are derived from the operation of properties devoted to the undertakings for which the company is organized.
3. Nonoperating revenues constitute all income except that derived from the sale of products, from services rendered, from return on property used by the company in its own operations, and from interest on current funds.
4. Operating expenses are those necessary to the production and distribution of the commodities sold, the services rendered, and the collection of the revenues.
5. Operating expenses are subclassified as to -
    - (a) Production expenses.
    - (b) Transmission, storage, and distribution.
    - (c) Utilization expenses.
    - (d) Commercial expense.
    - (f) New-business expense.
    - (g) General and miscellaneous expense and compared for electric, gas, and water utilities.
6. Utilities are grouped into four classes in accordance with the revenues produced.

INCOME AND EXPENSE ACCOUNTS

The Income Account.- The income account, commonly referred to as the income statement, is shown in Figure 3. It indicates the sources and disposition of income during a given period, and may be regarded as an accounting history of the operations and business activities of the corporation during such period. Any change in the items shown on the balance sheet at the end of a period, as compared with the balance sheet at the beginning of the period, must be explained by the income accounts or by the profit and loss accounts, except such changes as are merely transfers from one balance sheet account to another, not affecting the profit and loss balance, and entries reflecting the investment of additional capital. The income account represents a definite fiscal period, while the profit and loss account recognizes no distinction as to periods.

The income statement marks the transfer of the net results of operation from the operating management to the control of the board of directors. The first items in the income statement are "operating revenues" and "operating expenses," which represent the totals of the various revenue and expense accounts shown in Figures 4 and 5, respectively. The last entries show the disposition of net income made by the board and the amount that is merged with the accumulated profit and loss balance.

The income account is divided into four main divisions, the first section of which, comprising items 1 to 12 in Figure 3, is income from operating properties, which is defined in the National Commissioners' classification as follows:

> "Income from Operating Properties is income derived from the operation, or as a compensation for the use, of properties devoted to the undertakings for which the accounting company is organized."

In this section there are included, in addition to operating revenues and expense totals, the items of uncollectible bills, taxes, and rentals, in connection with which the following brief comment is made.

Uncollectible bills are shown separately from the operating expense accounts, largely because they are not of the same character as the items composing operating expenses. They represent amounts billed against consumers, but not collected, and are composed of the operating cost entering into the bill, plus the expected profit or return on investment. The operating-expense element having been previously included in expense, and the return element not being a proper expense item, the total of such bills, while a proper deduction from revenues, is not correctly designated as an operating expense.

Taxes represent another item that, while properly included in statements showing the cost of operation in determining net income for rate purposes, are more appropriately included as a separate deduction from revenue rather than in the operating-expense statement. The amount of the payments for taxes are not within control of the operating management, but are determined by the government.

Increases and decreases in taxes frequently follow a trend different from that indicated by other charges to operation, and from a statistical point of view this constitutes

ILLINOIS ELECTRIC LIGHT AND POWER COMPANY

INCOME ACCOUNT

Year ending December 31, 1924.

INCOME FROM OPERATING PROPERTIES:		
401	Operating revenues	$49,136,041.57
402	Operating expenses	31,583,421.90
403	Uncollectible bills	177,721.60
404	Taxes	5,699,584.65
	Total revenue deductions	$37,460,728.15
	Operating income	11,675,313.37
411	Rent for lease of other plants	186,555.18
412	Amortization of limited-term land rights	
	Total (items 411 and 412)	$ 186,555.18
413	Rent accrued from lease of plants - Cr.	86,221.78
	Net rent deduction (credit balance in red)	$ 100,333.40
	Net operating income	$11,574,979.97
INCOME FROM NONOPERATING PROPERTIES:		
421	Miscellaneous rent revenues	$ 34,276.31
422	Interest on long-term debt owned	163,108.46
423	Miscellaneous interest revenues	222,247.23
424	Dividend revenues	50,225.66
425	Income from special funds	124,844.16
426	Miscellaneous nonoperating revenues	26,178.86
	Total (items 421 to 426, inclusive)	$ 620.880.68
427	Nonoperating revenues deduction	20,568.43
	Total nonoperating income	$ 600,312.25
	Gross corporate income	$12,175,292.22
DEDUCTIONS FROM GROSS CORPORATE INCOME:		
431	Interest on long-term debt	$ 3,052,613.33
432	Miscellaneous interest deductions	357,876.95
433	Amortization of debt discount and expense	227,011.08
434	Amortization of premium on debts- Cr.	956.16
435	Miscellaneous amortization chargeable to income	147,285.00
436	Miscellaneous deductions from gross corporate income	710,090.49
	Total deductions from gross corporate income	$ 4,493,910.59
	Net income (loss in red)	$ 7,681,381.53
DISPOSITION OF NET INCOME:		
441	Sinking-fund appropriations	
442	Dividend appropriations of income	
443	Miscellaneous appropriations of net income	$ 129,264:16
	Total appropriations of net income	$ 129,264.16
	Balance transferred to profit and loss	$ 7,552,117.37

Figure 3 - Standard form of Income Account approved by the National Association of Railway and Utilities Commissioners, showing the account classification and the report rendered to the Illinois Commerce Commission.

OPERATING-REVENUE ACCOUNTS

ELECTRIC UTILITIES	GAS UTILITIES	WATER UTILITIES
SALES OF CURRENT:	SALES OF GAS:	SALES OF WATER:
601-Metered sales to general consumers.	601-Metered sales to general consumers.	601-Metered sales to general consumers.
602-Flat-rate sales to general consumers.	602-Flat-rate sales to general consumers.	602-Flat-rate sales to general consumers.
603-Railroad corporations.	603-Prepaid gas sales.	603-Flat-rate sales to irrigation customers
604-Other electrical corporations.	604-Other gas corporations.	604-Other water utilities.
605-Municipal street lighting.	605-Municipal street lighting.	605-Municipal hydrants.
606-Miscellaneous municipal.	606-Miscellaneous municipal sales.	606-Miscellaneous municipal sales.
		607-Forfeited discounts.
MISCELLANEOUS REVENUES:	MISCELLANEOUS REVENUES:	MISCELLANEOUS REVENUES:
611-Commissions on others' electricity.	611-Commissions on others' gas.	611-Commissions on others' water.
612-Rent from electric appliances.	612-Rent from gas appliances.	612-Rent from water appliances.
613-Rent from property used in operation.	613-Rent from property used in operating.	613-Merchandise and jobbing.
614-Merchandise and jobbing.	614-Merchandise and jobbing.	614-Miscellaneous operating revenues.
615-Miscellaneous operating revenue.	615-Miscellaneous operating revenues.	

Figure 4 — Operating-Revenue Accounts approved by the National Association of Railway and Utilities Commissioners.

All revenue accounts may be subdivided as desired by the management or as may be required by the regulatory commission. The most logical basis of division is to form a separate subaccount corresponding to the classes of service sold at a given rate. This is the general basis used in the following subdivisions of Accounts 601 and 602 of electric utilities which are required by the Illinois Commerce Commission.

Sales of Current.

601 — Metered Sales to General Consumers
- (a) Residence lighting.
- (b) Commercial lighting.
- (c) Commercial power.
- (d) Combination light and power
- (e) Other sales — Metered.

602 — Flat-rate Sales to General Consumers.
- (a) Residence lighting
- (b) Commercial lighting.
- (c) Commercial power.

OPERATING EXPENSE ACCOUNTS

Electric Utilities

700. PRODUCTION EXPENSES.

Operation: Steam-Power Generation

D C B	701.	Superintendence and labor.
A	701.1	Superintendence.
A	701.2	Boiler labor.
A	701.3	Engine labor.
A	701.4	Electrical labor.
A	701.5	Miscellaneous labor.
D	702.	Power plant supplies and expenses.
C B A	702.1	Fuel.
C B	702.2	Water.
C B	702.3	Miscellaneous supplies and expenses.
A	702.31	Lubricants.
A	702.32	Production supplies.
A	702.33	Station expense.

Maintenance:

D	703.	Maintenance of power plant.
C B A	703.1	Maintenance of station buildings.
C B	703.2	Maintenance of steam equipment.
A	703.21	Maintenance of furnaces and boilers.
A	703.22	Maintenance of boiler apparatus.
A	703.23	Maintenance of steam accessories.
A	703.24	Maintenance of steam engines.
A	703.25	Maintenance of turbo-generator units.
C B A	703.3	Maintenance of electrical equipment.
A	703.31	Maintenance of main generators.
A	703.32	Maintenance of exciting apparatus.
A	703.33	Maintenance of control and protective equipment.
A	703.34	Maintenance of transformers and converting apparatus.
C B A	703.4	Maintenance of miscellaneous power-plant equipment.
D C B A	704.	Steam generated, apportionment account.
D C B A	705.	Steam from other sources.

Operation: Hydroelectric Generation.

D C B	706.	Superintendence and labor.
A	706.1	Superintendence.
A	706.2	Hydroelectric labor.
A	706.3	Station labor.
A	706.4	Miscellaneous labor.
D	707.	Power-plant supplies and expenses.
C B A	707.1	Water for power.
C B	707.2	Miscellaneous supplies and expenses.

Gas Utilities

700. PRODUCTION EXPENSES.

Operation:

D C B	701.	Works superintendence and labor.
A	701.1	Works superintendence.
A	701.2	Boiler labor.
A	701.3	Retort labor.
A	701.4	Generator labor.
A	701.5	Purification labor.
A	701.6	Miscellaneous works labor.
D	702.	Boiler fuel and water.
C B A	702.1	Boiler fuel.
C B A	702.2	Water.
D C B A	703.	Fuel under retorts.
D C B A	704.	Coal carbonized.
D C B A	705.	Generator fuel.
D C B A	706.	Water-gas oil.
D C	707.	Miscellaneous works supplies and expenses.
B A	707.1	Coal-gas enricher.
B A	707.2	Purification supplies.

Water Utilities

700. SOURCE OF WATER SUPPLY EXPENSE.

D C B	701.	Superintendence and labor.
A	701.1	Superintendence.
A	701.2	Operating labor.
D C B A	702.	Operating supplies and expenses.
D C	703.	Maintenance of source of supply.
B A	703.1	Repairs to water-supply buildings.
B A	703.2	Repairs to surface source of supply facilities.
B A	703.3	Repairs to ground source of water supply.
D C B A	704.	Water purchased for resale.

Figure 5- Operating Expense Accounts (Continued #1)

OPERATING EXPENSE ACCOUNTS (Continued)

Electric Utilities			Gas Utilities			Water Utilities
A	707.21	Lubricants.				
A	707.22	Production supplies.				
A	707.23	Station expense.				
				707.3	Miscellaneous works expense.	
			A	707.4	Gas storage.	
Maintenance:			**Maintenance:**			
D	708.	Maintenance of power plant.	D C B A	708.	Maintenance of works and station structures.	
C B A	708.1	Maintenance of station buildings.				
C B	708.2	Maintenance of reservoirs, dams, and waterways.				
A	708.21	Maintenance of reservoirs, dams, and intakes.				
A	708.22	Maintenance of navigation facilities.				
A	708.23	Maintenance of waterways.				
A	708.24	Maintenance of forebays, penstocks, and tail races.				
A	708.25	Maintenance of way and cars.				
A	708.26	Maintenance of telephone system.				
A	708.27	Maintenance of production roads and trails.				
C B	708.3	Maintenance of hydroelectric equipment.				
A	708.31	Maintenance of water turbines and water wheels.				
A	708.32	Maintenance of turbo-generator units.				
A	708.33	Maintenance of main generators.				
A	708.34	Maintenance of exciting apparatus.				
A	708.35	Maintenance of control and protective equipment.				
A	708.36	Maintenance of transformers and converting appar.				
C B A	708.4	Maintenance of miscellaneous power plant equipt.				
Operation:		Gas-power Generation				
D C B	709.	Superintendence and labor.	D	709.	Maintenance of works equipment and apparatus.	
A	709.1	Superintendence.	C B	709.1	Maintenance of power equipment.	
			A	709.12	Maintenance of furnaces and boilers.	
			A	709.13	Maintenance of boiler apparatus.	
			A	709.14	Maintenance of steam accessories.	
			A	709.15	Maintenance of steam accessories.	
			A	709.16	Maintenance of internal combustion engines.	
A	709.2	Fuel labor.	A	709.17	Maintenance of miscellaneous power equipt.	
			C B	709.2	Maintenance of gas apparatus and tools.	
			A	709.21	Maintenance of benches and retorts.	
			A	709.22	Maintenance of water-gas sets.	
			A	709.23	Maintenance of purification apparatus.	
			A	709.24	Maintenance of holders.	
			A	709.25	Maintenance of accessory works equipment.	
A	709.3	Engine labor.	A	709.26	Maintenance of laboratory equipment.	
A	709.4	Electrical labor.	A	709.27	Maintenance of implements and accessories.	
A	709.5	Miscellaneous labor.				
D	710.	Power plant supplies and expenses.	D C B A	710.	Gas from other sources.	710. STEAM-POWER PUMPING
C B A	710.1	Engine fuel.				
C B	710.2	Miscellaneous supplies and expenses.				
A	710.21	Water.				
A	710.22	Lubricants.				
A	710.23	Production supplies.				
A	710.24	Station expense.				

Figure 5- Operating Expense Accounts (Continued #2)

OPERATING EXPENSE ACCOUNTS (Continued)

Electric Utilities			Gas Utilities			Water Utilities		
Maintenance:								
	711.	Maintenance of power plant.	D C B A	711.	Power from other sources.	D C	711.	Superintendence and labor.
C B A	711.1	Maintenance of station building.				B A	711.1	Superintendence.
C B	711.2	Maintenance of gas equipment (accessories.				B A	711.2	Boiler Labor.
A	711.21	Maintenance of fuel holders, producers and						
A	711.22	Maintenance of engines and turbines.						
C B	711.3	Maintenance of electric equipment.				B A	711.3	Pumping labor.
A	711.31	Maintenance of main generators.						
A	711.32	Maintenance of exciting apparatus.						
A	711.33	Maintenance of control and protective apparatus						
A	711.34	Maintenance of transformers and converting app.						
C B A	711.4	Maintenance of miscellaneous power-plant equipt.				B A	711.4	Miscellaneous Labor
D C B A	712.	Power gas from other sources.	D C B A	712.	Steam generated—apportionment account.	D C	712.	Steam Pumping Supplies and Expenses
						B A	712.1	Fuel.
						B A	712.2	Water for steam.
						B A	712.3	Lubricants.
						B A	712.4	Miscellaneous steam-power pumping supplies and Exp.
D C B A	713.	Electric energy from other sources.	D C B A	713.	Residuals produced — Cr.	D C	713.	Maintenance of steam Pumping Plant.
						B A	713.1	Maintenance of steam power pumping buildings
						B A	713.2	Maintenance of boilers and accessories.
						B A	713.3	Maintenance of steam-power pumping equipment.
						B A	713.4	Maintenance of miscellaneous steam-pumping plant equipt.
D C B A	714.	Duplicate production charges — Cr.	D C B A	714.	Residuals expense.	D C B A	714.	Steam from other sources.
D C B A	715.	Production expenses transferred — Cr.	D C B A	715.	Duplicate production charges — Cr.	D C B A	715.	Steam Generated — Apportionment Account.
			D C B A	716.	Production expenses transferred — Cr.			
	720.	TRANSMISSION EXPENSES.		720.	TRANSMISSION AND DISTRIBUTION EXPENSES.		720.	ELECTRIC POWER PUMPING.
D	721.	Transmission operation and maintenance.	D C	721.	Distribution operation.	D C	721.	Superintendence and labor.
C B A	721.1	Superintendence.	B A	721.1	Transmission pumping.	B A	721.1	Superintendence.
C B A	721.2	Sub-station labor.	B A	721.2	Distribution superintendence and expense.	B A	721.2	Pumping Labor.
C B A	721.3	Sub-station supplies and expense.	A	721.21	Distribution superintendence.			
			A	721.22	Distribution supplies and expenses.			
			B	721.3	Consumers premises work.	B A	721.3	Miscellaneous Labor
			A	721.31	Maintaining installations.			
			A	721.32	Work on consumers' premises.			
C B	721.4	Operation of transmission lines.	B A	721.4	Removing and resetting meters.			
A	721.41	Labor and expense—underground conduits.						
A	721.42	Labor and expense—poles, towers and fixtures.						
A	721.43	Labor and expense—overhead conduits.						
A	721.44	Labor and expense—underground conductors.						
A	721.45	Miscellaneous supplies and expenses.						
C B A	721.5	Maintenance of structures.						
C B A	721.6	Maintenance of sub-station equipment.						
C B A	721.7	Maintenance of underground conduits.						
C B	721.8	Maintenance of transmission lines.						
A	721.81	Maintenance of poles, towers and fixtures.						
A	721.82	Maintenance of overhead conductors.						
A	721.83	Maintenance of underground conductors.						
C B A	721.9	Maintenance of roads and trails.						

Figure 5- Operating Expense Accounts (Continued #3)

OPERATING EXPENSE ACCOUNTS (Continued)

Electric Utilities

	730.	DISTRIBUTION EXPENSES.
D	731.	Distribution, operation, and maintenance.
C B A	731.1	Superintendence.
A	731.2	Substation expenses.
A	731.21	Substation labor.
A	731.22	Substation supplies and expenses.
C B	731.3	Storage-battery expenses.
A	731.31	Storage-battery labor.
A	731.32	Storage-battery supplies and expenses.
C B	731.4	Operation of distribution lines.
A	731.41	Labor and expense—underground conduits.
A	731.42	Labor and expense—poles, towers, and fixtures.
A	731.43	Labor and expense—overhead conductors.
A	731.44	Labor and expense—underground conductors.
A	731.45	Miscellaneous supplies and expenses.
C B	731.5	Meter and transformer operation.
A	731.51	Salaries and expenses-meter department.
A	731.52	Testing meters.
A	731.53	Miscellaneous expenses—meter department.
A	731.54	Removing and resetting meters.
A	731.55	Removing and resetting transformers.
C B A	732.1	Maintenance of structures.
C B A	732.2	Maintenance of substation equipment.
C B A	732.3	Maintenance of storage-battery equipment.
C B A	732.4	Maintenance of underground conduits.
C B A	732.5	Maintenance of distribution lines.
A	732.51	Maintenance of poles, towers, and fixtures.
A	732.52	Maintenance of overhead conductors.
A	732.53	Maintenance of underground conductors.
C B A	732.6	Maintenance of services.
C B	732.7	Maintenance of transformers and meters.
A	732.71	Maintenance of line transformers.
A	732.72	Maintenance of consumers' meters.

Gas Utilities

Maintenance:

D C	722.	Distribution maintenance.
B A	722.1	Maintenance of mains.
B A	722.2	Maintenance of services.
B A	722.3	Miscellaneous distribution maintenance.
A	722.31	Maintenance of shop buildings.
A	722.32	Maintenance of distribution implements and accessories.
A	722.33	Maintenance of gas appliances.
D C B A	723.	Maintenance of consumers' meters.
D C B A	724.	Duplicate distribution charges — Cr.
	730.	STREET LIGHTING EXPENSES.
D C B A	731.	Operation of street lamps.
D C B A	732.	Maintenance of street lamps.

Water Utilities

D C	722.	Electric pumping supplies and expenses.
B A	722.3	Lubricants.
B A	722.4	Miscellaneous electric power pumping supplies and expenses.
D C	723.	Maintenance of electric pumping plant.
B A	723.1	Maintenance of electric pumping buildings.
B A	723.2	Maintenance of electric pumping equipment.
B A	723.3	Maintenance of miscellaneous pumping station equipment.
D C B A	724.	Electric energy from other sources.
D C	730.	GAS OR OIL POWER PUMPING.
B A	731.	Superintendence and labor.
B A	731.1	Superintendence.
B A	731.2	Producer labor.
B A	731.3	Pumping labor.
B A	731.4	Miscellaneous pumping labor.
D C	732.	Gas or oil pumping supplies and expenses.
B A	732.1	Fuel.
B A	732.2	Water.
B A	732.3	Lubricant.
B A	732.4	Miscellaneous gas or oil pumping station supplies expense.
D C	733.	Maintenance of gas or oil pumping plant.
B A	733.1	Maintenance of gas or oil power pumping buildings.
B A	733.2	Maintenance of gas producer and auxiliary equipt.

Figure 5- Operating expense accounts (Continued # 4).

OPERATING EXPENSE ACCOUNTS (Continued)

Electric Utilities

UTILIZATION.

	750.	
D	751.	Utilization operation and maintenance.
C B	751.1	Commercial lamps-operation.
A	751.11	Commercial arc lamps.
A	751.12	Incandescent lamps-renewals.
A	751.13	Incandescent lamps-renewals.
C B	751.2	Consumers' installation and inspection work.
A	751.21	Inspection-consumers' premises.
A	751.22	Consumers' installations.
C B	751.3	Municipal street lamps-operation.
A	751.31	Municipal street arc lamps.
A	751.32	Municipal street incandescent installation.
A	751.33	Municipal street incandescent renewals.
C B A	751.4	Maintenance of commercial lamps.
B	751.5	Maintenance of municipal street-lighting equipment.
A	751.51	Maintenance of municipal street arc lamps.
A	751.52	Maintenance of municipal street incandescent lamps.

Gas Utilities

Water Utilities

B A	733.3	Maintenance of gas or oil power pumping equipment.
B A	733.4	Maintenance of miscellaneous gas or oil pumping equipment.
D C B A	734.	Power gas purchases or transferred from other departments.
	H-730.	HYDRAULIC-POWER PUMPING
D C	H-731.	Superintendence and labor.
B A	H-731.1	Superintendence.
B A	H-731.2	Hydraulic labor.
B A	H-731.3	Pump labor.
B A	H-731.4	Miscellaneous labor.
D C	H-732.	Hydraulic pumping supplies and expenses.
B A	H-732.3	Lubricants.
B A	H-732.4	Miscellaneous pumping station supplies and expense.
D C	H-733.	Maintenance of hydraulic pumping plant.
B A	H-733.1	Maintenance of dams, canals, flumes, and buildings.
B A	H-733.2	Maintenance of turbines and water wheels.
B A	H-733.4	Maintenance of miscellaneous hydraulic pumping equipment.
D C	H-734.	Hydraulic power purchased.
		740. PURIFICATION EXPENSES.
D C	741.	Purification supplies and expenses.
B A	741.1	Superintendence.
B A	742.2	Purification labor.
D C B A	742.	Purification supplies and expenses.
D C	743.	Maintenance of purification plant.
B A	743.1	Maintenance of purification buildings.
B A	743.2	Maintenance of purification equipment.
D C B A	748.	Duplicate production charges - Cr.
D C B A	749.	Production expenses transferred - Cr.
	750.	TRANSMISSION AND DISTRIBUTION.
D C	751.	Operating labor, supplies, and expense.
B A	751.1	Superintendence.
B A	751.2	Storage, reservoir, tank, and standpipe labor.
B A	751.3	Maps and records.
B A	751.4	Inspecting and testing meters.
B A	751.5	Removing and resetting meters.
B A	751.6	Inspecting customers' installations.
B A	751.7	Other transmission and distribution operating labor.

(Figure 5 - Operating expense accounts (continued #6)

OPERATING EXPENSE ACCOUNTS (Continued)

Electric Utilities

	760.	COMMERCIAL EXPENSE.
D C	761.	Commercial administration.
B A	761.1	Commercial general labor.
B	761.2	Commercial books and contracts.
A	761.21	Commercial bookkeeping.
A	761.22	Commercial contracts,
B	761.3	Commercial meter reading and collecting.
A	761.31	Commercial collecting,
A	761.32	Meter reading.
B A	761.4	Commercial supplies and expenses.
D C B A	762.	Agents' commissions
	770.	NEW BUSINESS EXPENSES.
D C	771.	New Business expenses.
B	771.1	New Business salaries.
A	771.11	New business management salaries.
A	771.12	New business advertising salaries.
B	771.2	New business supplies and expenses.
A	771.21	Demonstrations.
A	771.22	Wiring and appliances.
A	771.23	Advertising supplies and expenses.
A	771.24	Canvassing and soliciting.
A	771.25	Miscellaneous new business supplies and expenses.
	780.	GENERAL AND MISCELLANEOUS EXPENSES.
D	781.	Undistributed general expenses.
C B	781.1	General office salaries.
A	781.11	Administrative salaries.
C A	781.12	Other general office salaries.
C	781.2	Miscellaneous general expenses.
B A	781.21	General office supplies and expenses.
B A	781.22	General stationery and printing.
B A	781.23	Maintenance of general structures.
B A	781.24	Operation of communication system.
B A	781.25	Maintenance of communication system.
B A	781.26	Law expenses.
B A	781.27	Insurance.
B A	781.28	Store expenses.

Gas Utilities

	760.	COMMERCIAL EXPENSE.
D C	761.	Commercial administration.
B A	761.1	Commercial general labor.
B	761.2	Commercial books and contracts.
A	761.21	Commercial bookkeeping.
A	761.22	Commercial contracts.
B	761.3	Commercial meter reading and collecting.
A	761.31	Commercial collecting.
A	761.32	Meter reading.
B A	761.4	Commercial supplies and expenses.
D C B A	762.	Agents' commissions.
	770.	NEW BUSINESS EXPENSES.
D C	771.	New business expenses.
B	771.1	New business salaries.
A	771.11	New business management salaries.
A	771.12	New business advertising salaries.
B	771.2	New business supplies and expenses.
A	771.21	Demonstrations.
A	771.23	Advertising supplies and expenses.
A	771.24	Canvassing and soliciting.
A	771.25	Miscellaneous new-business supplies and expenses.
	780.	GENERAL AND MISCELLANEOUS EXPENSE.
D	781.	Undistributed general expenses.
C B	781.1	General office salaries.
A	781.11	Administrative salaries.
A	781.12	Other general office salaries.
C	781.2	Miscellaneous general expenses.
B A	781.21	General office supplies and expenses.
B A	781.22	General stationery and printing.
B A	781.23	Maintenance of general structures.
B A	781.26	Law expenses.
B A	781.27	Insurance.
B A	781.28	Store expenses.

B A	752.	Miscellaneous distribution supplies and expenses
D C	753.	Maintenance of transmission and distribution system.
B A	753.1	Maintenance of transmission and distribution bldgs.
B A	753.2	Maintenance of transmission mains.
B A	753.3	Maintenance of storage reservoir tanks and standpipe.
B A	753.4	Maintenance of distribution mains.
B A	753.5	Maintenance of service.
B A	753.6	Maintenance of meters.
B A	753.7	Maintenance of hydrants.
B A	753.8	Maintenance of fountains and troughs.
	760.	COMMERCIAL ESPENSE.
D C	761.	Commercial administration.
B A	761.1	Commercial labor.
B A	761.2	Meter Reading.
B A	761.3	Consumers' Accounts.
B A	761.4	Collecting.
B A	761.5	Contract Department.
B A	761.6	Miscellaneous commercial Department expenses.
	770.	NEW BUSINESS EXPENSES.
D C	771.	New Business Expenses.
B A	771.1	New Business Salaries.
B A	771.2	New business supplies and expenses.
	780.	GENERAL AND MISCELLANEOUS EXPENSE.
D	781.	Undistributed general expenses.
C B	781.1	General office salaries.
A	781.11	Administrative salaries.
A	781.12	Other general office salaries.
C	781.2	Miscellaneous general expenses.
B A	781.21	General office supplies and expenses.
B A	781.22	General stationery and printing.
B A	781.23	Maintenance of general structures
B A	781.26	Law expenses.
B A	781.27	Insurance
B A	781.28	Store expenses.

Figure 5. Operating expense accounts (continued #6)

OPERATING EXPENSE ACCOUNTS (Continued)

Electric Utilities			Gas Utilities			Water Utilities		
B A	781.29	Transportation expenses.	B A	781.29	Transportation expenses.	B A	781.29	Transportation expenses.
B A	781.30	Undistributed adjustments.	B A	781.30	Undistributed adjustments.	B A	781.30	Undistributed expenses.
B A	781.31	Rentals.	B A	781.31	Rentals.			
B A	781.32	Other miscellaneous general expenses.	B A	781.32	Other miscellaneous general expenses.	B A	781.32	Other miscellaneous general expenses.
D C B A	782.	Retirement expense.	D C B A	782.	Retirement expense.	D C B A	782.	Retirement expense.
D C B	783.	Injuries and damages.	D C B	783.	Injuries and damages	D C B	783.	Injuries and damages.
A	783.1	Claim-department expenses.	A	783.1	Claim-department expenses.	A	783.1	Claim-department expenses.
A	783.2	Medical expenses.	A	783.2	Medical expenses.	A	783.2	Medical expenses.
A	783.3	Injuries to employes.	A	783.3	Injuries to employes.	A	783.3	Injuries to employes.
A	783.4	Other personal injuries and property damage.	A	783.4	Other personal injuries and property damage.	A	783.4	Other personal injuries and property damage.
A	783.5	Miscellaneous accident expenses.	A	783.5	Miscellaneous accident expenses.	A	783.5	Miscellaneous accident expenses.
D C B A	784.	Regulatory commission expenses.	D C B A	784.	Regulatory commission expenses.	D C B A	784.	Regulatory commission expenses.
D C B	785.	Relief and welfare work.	D C B	785.	Relief and welfare work.	D C B	785.	Relief and welfare work.
A	785.1	Employes' welfare department.	A	785.1	Employes' welfare department.	A	785.1	Employes' welfare department.
A	785.2	Pensions.	A	785.2	Pensions.	A	785.2	Pensions.
D C B A	786.	Franchise requirements.	D C B A	786.	Franchise requirements.	D C B A	786.	Franchise requirements.
D C B A	787.	Amortization of franchises.	D C B A	787.	Amortization of franchises.	D C B A	787.	Amortization of franchises.
D C B A	788.	Electric expenses transferred—Cr.	D C B A	788.	Gas expenses transferred—Cr.	D C B A	788.	Water expenses transferred—Cr.
D C B A	789.	Joint operating expenses—Cr.	D C B A	789.	Joint operating expenses—Cr.	D C B A	789.	Joint operating expenses—Cr.
D C B A	790.	Duplicate miscellaneous charges—Cr.	D C B A	790.	Duplicate miscellaneous charges—Cr.	D C B A	790.	Duplicate miscellaneous charges—Cr.

FIGURE 5 - Operating Expense Accounts Approved by the National Association of Railway Utilities Commissioners.

a sufficient reason for their separate statement. Cost of operating labor and materials bear a close relation to business activities reflected in production and sales, but taxes do not.

Rents paid for the use of property frequently present a number of complications. The payment may represent pure rent or it may include maintenance, taxes, depreciation, and other elements. There is also a wide range as to the amount involved. The payments may cover minor rents for pole attachments, the use of small storage facilities and other small rental payments which are more conveniently charged to operating expenses. In other cases the rental may cover an entire operating plant or unit. The following definitions and explanations contained in the National Commissioners' classification indicates the method of treatment prescribed in this classification:

> "Rents are payments for the use of property employed in the business but not owned by the accounting company. The standard form of income statement established by this system of accounts provides, therefore, for deducting from gross income, rentals paid for the use of property not owned, in order that the income available for a return upon that part of the capital invested in the enterprise by the accounting company may clearly appear. Minor rents, however, such as rents for land, buildings, and comparatively small portions of plant and equipment (not constituting a distinct operating unit), used for departmental purposes, are more suitably, for administrative purposes, charged directly to one of the divisions of the operating-expense schedules, and suitable treatment of such expenditures is provided for in the operating-expense accounts."

The net result, after deducting from operating revenues the three items, operating expenses, uncollectible bills, and taxes, is designated "operating income" (applicable to corporate and leased properties), defined in the Commissioners' classification as follows:

> "Operating income applicable to corporate and leased properties is that income arising from any class of operations which is available to pay a return in one form or another upon capital employed in that class of operations."

From operating income is deducted the item of rents, the net result after which deduction is designated "Income Applicable to Corporate Property," which is defined in the Commissioners' classification as follows:

> "Income applicable to corporate property is that income which is available to pay a return in one form or another on capital owned by the accounting company. It is the operating income applicable to corporate and leased properties, less rentals for the use of capital not owned."

The second section of the income account is "income from nonoperating properties," comprising items 13 to 20, Figure 3, which is defined in the Commissioners' classification as follows:

> "Income from nonoperating properties is income derived from properties not devoted to the undertakings for which the accounting company is organized; also from properties not belonging to the accounting company, but in which it has an interest thru ownership of stocks, bonds, or otherwise."

The sum of the balances in the accounts of this section and the net operating income shown in the first section constitute the gross corporate income (item 21, Figure 3), which is defined as follows:

> "Gross corporate income is that income applicable to corporate properties, that is, gross income less rentals for capital not owned".

The third section in the income account is deductions from gross corporate income, comprising items 22 to 28, inclusive, Figure 3. This includes interest and other contractual deductions. Deducting the total of this section from the gross corporate income results in net income (item 29, Figure 3), which is defined as follows:

> "Net Income is that amount left after all contractual or compulsory deductions have been made from gross income except such sinking-fund accruals as are required to be temporarily reserved."

The fourth section is "disposition of net income." This section shows the portion of the net income which the directors have appropriated for sinking funds, dividends, or other purposes, as well as the remainder which is transferred to profit and loss.

The standard form of income account shown in Figure 3 is the same for electric, gas, or water utilities. It will be noted that, necessarily, companies operating two or more kinds of utilities must keep separate income accounts for each class, or at least establish subaccounts so that the net income of each utility may be stated.

In cases where a utility operates in more than one municipality, and a change in the rates in one or more of these municipalities is desired, it frequently becomes necessary to assign or apportion to the territory in which rates are in question,the appropriate part of the various accounts in the income statement. This fact should always be kept in mind when installing or modifying the accounting system.

Operating-Revenue Accounts.- Operating revenues of electric, gas, and water utilities are defined in the National Commissioners' classifications, as follows:

> "Operating-revenue accounts are those in which are recorded the amount which the accounting company receives or becomes lawfully entitled to recover for services rendered, for products or merchandise sold, as a return on property used in the company's own operations, and as interest on current funds, such as daily bank balances."

The operating-revenue accounts of each kind of utility (shown in Figure 4) are divided into two general groups, namely:

1. Revenues from sales of electric energy, gas, or water.
2. Miscellaneous revenues.

The first group consists of the accounts to which are credited revenues directly resulting from the sales of electric energy, gas, or water. The second group includes revenues derived from operations incidental to the principal business of the company, but closely related to such business thru the use of the same property or facilities that are used for utility operations.

Revenues are usually based on rates applied to the quantity of electric energy, gas, or water used, as measured by meter. Rates not based on meter registration are called "flat rates." Flat rates are not used extensively except by water utilities, and even here they are fast giving place to rates based on measurement by meter. When flat rates are applied to water used in residences they are based on the number of rooms in the house, or on the number of faucets, washbasins, bathtubs, and other facilities in use. Flat rates for service in buildings used for business purposes are usually based on the character of facilities employed in connection with the water supply and such factors as indicate the approximate quantity used. Flat rates are usually paid in advance of the period to which they apply.

Where discounts are allowed for the prompt payment of consumers' bills, it is the general practice to render the bills as the net amount. In case the consumer does not take advantage of the discount by paying the bill within the discount period, the amount of the discount is added to the bill and to the consumer's account in the ledger. Where a penalty is applied to bills not paid within a specific period, the accounting is similar, the amount of the penalty being added to the bill and to the account. Any discounts, penalties, or corrections should be charged or credited to the revenue accounts to which they relate.

Merchandise and jobbing revenue account includes the revenues obtained from sales of any merchandise which the company handles, and from work done for consumers, such as wiring premises for electric service, piping for gas or water, and making repairs, or any other work for which the company charges the consumers. The expense incurred in connection with such work is charged against the same account. Subdivisions of the merchandise and jobbing revenue account are frequently desirable and may be made if the company so desires.

If a utility desires to charge its various departments for electric energy, gas, or water (which it has itself produced or purchased for re-sale) used in such departments, the value thereof should not be credited to revenue but to the appropriate account, "Duplicate Charges - Cr.," provided therefore in the operating expense (production-expense group or general and miscellaneous expense group, as may be appropriate).

Utilities operating in more than one municipality will usually find it desirable to keep their record of revenues so as to show separately the revenues earned in each municipality. It is not necessary to open a separate account for each municipality, but a permanent and convenient record should be kept, so that the revenues derived from any one municipality may be readily ascertained.

Operating Expense Accounts.- Operating expenses of electric, gas, and water utilities are defined in the National Commissioners' classifications, as follows:

> "The term 'operating expenses' as used in this classification means such expenses as are necessary to the maintenance of the corporate organization, the rendering of service required or authorized by law, the sale of merchandise, the production (including herein capital consumed) and disposition of commodities produced, and the collection of the revenues therefor. Expenses directly incident to the collection of nonoperating revenues and the maintenance of property from which nonoperating revenues are derived are excluded from operating expenses."

The primary accounts for operating expenses (Figure 5) are grouped so as to show separately the expenses pertaining to different functions involved in production, distribution, and other activities. This is most important. Electric utilities frequently sell energy, or transfer it to a coordinate department, at switchboard costs, plus such profit as may be determined upon, which is considerably less than the cost, after distribution expense and other costs incident to delivery and collection from numerous consumers are added.

Some companies use more than one method of production, generating some current by water power and some by steam power, and they may also purchase part of the energy distributed by them. In such cases it is important to know the cost of the energy derived from each source. Practically the same problems are involved in the gas utility, where different methods of production are employed, and in water utilities, where there are different sources of power used for pumping water.

Operating Expenses Classified as to Operating Functions.- The operating-expense accounts, as shown in Figure 5, are classified with reference to the more important operating and administrative functions, as follows:

ELECTRIC	GAS	WATER
Production Expense. Steam-power generation. Hydroelectric generation. Gas-power generation.	Production Expense Coal Gas (1) Water Gas (1)	Production Expense. Source of water-supply expense. Steam-power pumping. Electric-power pumping. Gas or oil power pumping. Hydraulic-power pumping. Purification.
Transmission Expense.	Transmission and Distribution Expense.	Transmission and Distribution Expense.
Distribution Expense.		
Utilization Expense.	Street-Lighting Expense.	
Commercial Expense.	Commercial Expense.	Commercial Expense.
New-Business Expense.	New-Business Expense.	New-Business Expense.
General and Miscellaneous Expenses.	General and Miscellaneous Expenses.	General and Miscellaneous Expenses.

NOTE:
The class of expense included under "Utilization" in the electric-utility accounts is included in Distribution and Street Lighting

Expense in the Gas classification. In the water-utility accounts "Inspecting Customers' Installations," a primary account in the group "Transmission and Distribution," covers this class of expense so far as found in water-utility accounts.

(1) All of the gas-production accounts shown in Fig. 5 relate both to coal gas and water gas, except the following, which are restricted as indicated:

Accounts relating solely to coal gas -
- Retort-house labor.
- Fuel under retorts.
- Coal carbonized.
- Coal-gas enricher.
- Repairs of benches and retorts.

Accounts relating solely to water gas -
- Generator-house labor.
- Generator fuel.
- Water-gas oil.
- Repairs of water-gas sets.

The accounts classified as "Operating Expense" accounts are designed to secure proper accounting for all items of operating expense and to develop a satisfactory cost system for electric, gas, and water utilities.

Production Costs.- It will be observed that provision is made for the separate determination of production costs of electric energy by each method of production--steam, hydraulic, and gas. The gas-utility accounts are so constructed and arranged as to permit the determination of cost of producing gas by the carbonization of coal and by the processes used in "water gas" production. In the water-utility accounts, provision is made for showing separately the cost of pumping water by steam power, electric power, gas or oil power, and hydraulic power.

In each class of utility accounts, further subdivisions than indicated in Figure 5 are made whenever a company operates two or more generating or pumping stations. The production accounts in such cases are subdivided so as to show separately the cost of production at each station.

In the water-utility-production accounts there are, of course, no manufacturing processes involved in the "Production" group of accounts. In this group, however, we have the accounts covering the expense relating to the source of water supply. There is also included in the water-utility accounts a separate subdivision for purification expense, which includes a group of accounts to which is charged the cost of purifying water by various processes to make it suitable for consumption.

The relative importance of this operation, because of its cost and the varied conditions under which it is performed, justifies a distinct group of accounts. Similar accounts are not required in the electric-utility business. In the gas-utility accounts, the purification process is important, but from the standpoint of cost they are relatively of less important than in the water utility. They are included in the gas "production" accounts as itemized in Fig. 5.

Transmission, Storage, and Distribution.- The next two groups include the accounts relating to the transmission, storage, and distribution of electric energy, gas, and water, and generally may be said to include the cost of conveying the product, including storage cost, if any, from the point where produced to the point of delivery to the consumer. The point of delivery is usually at a meter installed for measurement of the energy as delivered to the consumer. So far as practicable, a distinction is made between transmission and distribution expense. However, the characteristics of plant construction and operation often make it impracticable to maintain this distinction.

In general, transmission is what might be called shipment or transmission in bulk to a point where retail distribution to the various consumers begins. Electric energy may now be transmitted hundreds of miles over high-voltage lines. Gas is in many instances piped considerable distances to supply various municipalities from a single generating plant. There has not been so much tendency to install water pipes connecting different municipalities, altho there are many instances where this has been done. In some of the Western states water is carried long distances, either by pipe or open waterway.

Utilization Expense.- "Utilization" includes the accounts in the electric classification to which is charged the expense incurred in assisting the consumer in keeping his energy-consuming equipment in condition for rendering satisfactory service. This also includes the maintenance of lamps and other equipment for the consumer's use, where the company undertakes to maintain such equipment at its own expense. In the gas accounts, expenses of this character are included in "distribution" accounts, except expense relating to street lighting, which is included in separate accounts.

Commercial Expense.- "Commercial" expense includes the accounts to which is charged the cost of ascertaining and recording on the books of the company the sales of electric energy, gas, or water; also the cost of collecting revenues, keeping record of contracts with customers, and all other matters directly relating to the accounting for revenues from service.

New Business Expense. - "New Business" includes those accounts to which is charged the cost of promoting sales of the company's output and generally developing or increasing the market therefor. The new-business accounts in the water-utility classification as compared with the same class of accounts in the other utilities are relatively unimportant. As a rule, water companies do not expend large sums for advertising and soliciting for the purpose of gaining new business, except possibly in the development period. There is not much competition for their service in well-settled communities, except in the case of railroads and other large consumers, who frequently provide their own water supply.

The electric light and power business competes with other methods of lighting, such as gas, gasoline, and oil, while in the power field there is competition with steam power, water power, and gasoline or oil power. There is also a field for extension of the business by inducing customers to acquire and use new inventions consuming electric energy, such as equipment for heating, cooking, washing, ironing, motors for running sewing machines, and other household and shop appliances. The gas-utility business also has a field of development similar in a general way to that referred to in connection with electric utilities.

General and Miscellaneous Expense.- "General and Miscellaneous" includes those accounts to which are charged the items of operating expense not assignable to any particular one of the foregoing groups, these expense items being those which are related to all departments of the company's business or assignable to two or more functions.

Special Features Facilitating Cost Studies.- So far as is practicable, separate primary accounts are provided for the costs of labor and material. The advantages of this plan are apparent when it is recalled that frequently changes are made or proposed to be made in wage schedules, and that there are also frequent changes in prices of materials. By keeping these two elements of cost separate, the effects of specific increases in commodity prices and wages may be more readily determined.

Another important division which has been provided for, so far as is practicable, is found in keeping separate the cost of running the plant and the cost of maintaining it. For instance, in the electric-utility group of operating-expense accounts, the accounts 701 to 702.23 are "Operation" accounts, and the accounts 703 to 703.4 are "Maintenance" accounts.

The "Maintenance" accounts are also constructed to correspond with the fixed-capital accounts. For instance, in the electric-utility classification, account 812, "Maintenance of Substation Equipment," covers maintenance of property included in fixed-capital, account 328, "Substation Equipment."

This arrangement has the advantage of showing the cost of maintaining each class of equipment. It also simplifies the accounting in cases of reconstruction, where the costs are to be divided between fixed capital and maintenance.

In the gas-utility accounts the revenues from sales of by-products, designated as "Residuals," such as coke, tar, ammonia, etc., are included in the operating-expense group as a credit to production cost - (Account 713, "Residuals Produced - Cr."). This treatment of residuals is very desirable from the standpoind of production-cost statistics. As many companies have facilities for manufacturing both coal gas and water gas, the value of residuals is a factor in determining which kind of gas shall be made or the relative amounts of each.

Operating-Expense Accounts Adapted to Both Large and Small Companies.- The operating-expense accounts, approved by the National Association of Railway and Utilities Commissioners, are shown in Figure 5 in parallel columns for electric, gas, and water utilities.

For the purpose of these classifications electric, gas, and water corporations are divided into four classes, as follows:

Class A. Corporations having average annual operating revenues exceeding $250,000.

Class B. Corporations having average annual operating revenues exceeding $50,000, but not over $250,000.

Class C. Corporations having average annual operating revenues exceeding $10,000, but not over $50,000.

Class D. Corporations having average annual operating revenues not exceeding $10,000.

In order that frequent changes may be avoided, the class to which an electric, gas, or water corporation is assigned may be determined by the average of its annual revenues for the three years next preceding the effective date of this accounting classification. If at the close of any fiscal year following, the average of its annual revenues for the three next preceding years is greater than the maximum for the class in which the corporation has been grouped, it shall automatically be grouped with the higher class in which it falls by virtue of such increased annual revenues. Corporations engaged in new enterprises, the annual revenue from which is not known in advance, shall be classed in accordance with a reasonable estimate of their prospective revenue.

The classification of operating expenses (Figure 5), is adapted to corporations in all four classes. The primary accounts suitable for the smaller companies are expanded and subdivided to meet the needs of each class of larger utilities in which greater detail is required.

In Figure 5 the letters at the left (A, B, C. D,) refer to the various classes of utilities, and indicate the accounts which each class of utility is required to keep. For example, Class D is required to keep all accounts opposite which the letter D appears, in so far as such accounts are applicable to its business. Account 701, preceded by the letters D, C, B, indicates that Classes, D, C, and B corporations will keep this account, whereas Class A corporations will keep subaccounts indicated by 701.1, 701.2, 701.3, 701.4, and 701.5.

Reader's Test of Subject Matter in Chapter III

The following questions are given to enable the reader to check himself as to his grasp of the important points discussed under the subject, "Income and Expense Accounts."

1. What is the nature and use of the income account?
2. Distinguish between operating and nonoperating revenues?
3. Why are uncollectible bills and taxes stated separately from operating expenses in the income account?
4. What items come under the classification of "Income from Non-Operating Properties"?
5. What is meant by "Disposition of Net Income"?
6. What is the National Commissioners' definition of operating expenses?
7. What are the comparisons and differences in the accounts to be kept for production costs in electric, gas, and water utilities?
8. What constitutes commercial expense and also new-business expense?
9. In making provision for the depreciation of buildings, plant, and equipment, which expense account would be charged and which reserve account credited?
10. To which account would the cost of maintaining boilers and furnaces and their foundations and settings be charged in the case of an electric utility?

CHAPTER IV

CAPITAL AND REVENUE EXPENDITURES

....

The essential points brought out in this section are briefly summarized in the following:

1. Continuous construction, coupled with the large investment in permanent property, gives special importance to the matter of distinguishing between capital and income expenditures.
2. The engineer or superintendent regularly engaged with operating duties may devote considerable time to construction work, which should be capitalized in accordance with the conditions in each case.
3. The capitalization of unproductive property is justified in public utilities.
4. Rule for capitalizing replacements.
5. Taxes during construction may be capitalized.
6. Rule is established with reference to capitalizing improvements on leased property.
7. The accounting rules prescribed treat discount on bonds as being in the nature of interest paid in advance.
8. Projects abandoned should receive very careful consideration.
9. The cost of obtaining franchises may usually be capitalized.

CAPITAL AND REVENUE EXPENDITURES

Consideration of Construction and Operation Costs Important.- There are certain phases of the accounting for expenditures of public utilities in which material differences are found as compared with other forms of industry. A manufacturing, wholesale, or retail enterprise having constructed the necessary plants and buildings, does not have a continuous construction program, as does the public utility in a growing community. In such industries, the inventory problems are very important, sometimes quite serious, while the public utility has little concern over inventories. Its investment is principally in fixed property, which can be used only in its particular business. Its sales are sales of service. Its products cannot be stored, except to a very minor extent. It must stand ready to meet instantly any demand that may be made upon it. Its plant investment must, therefore, at all times be equal to the greatest demand that may be made for its service.

The increase in population and in business activities in the community usually require constant additions to the plant. This continuous construction, coupled with the large investment in permanent property, gives special importance to the matter of distinguishing between capital and income expenditures, or, as they are more commonly thought of, as construction and operating costs.

The accounting for retirements of property and the provisions to be made therefor is another feature which is of special importance in the public-utility business. Its importance is also largely due to the great amount of permanent plant required by a utility. Many theories have been advanced in respect of depreciation and retirements, and it is one of the most discussed questions in public-utility circles.

When schedules of utility rates for service are put into effect, or changes in some rates are considered, the accounts and statistical records must be relied upon for information absolutely essential to the consideration of the matter. There must be determined, among other things, the total cost of service, the cost of each class of service, the total revenues required, and what portion should be secured from each class of service. The accountant must be able to present to the utility management and to the Commission complete financial statements, authoritative estimates, and such other data as may be required.

Importance of Separation of Capital and Revenue Expenditures.- A factor which contributes to make the distinction between capital and revenue expenditures difficult, is that most public-service corporations have very extensive additions to plant made by their own force and not by outside contractors. The work is done, under the direction of their own engineers, by their own workmen. As these same forces also do the current maintenance work, and use the same kinds of materials for construction as for maintenance purposes, it is practically impossible to determine merely from the nature of the labor and material expenditures whether they are capital or revenue charges, unless the accountant in charge is constantly on his guard to see that the separation is properly carried out. The satisfactory solution of the problem lies in the proper system of cost accounts of its construction work, so as to relate the expenditures to the thing done or accomplished.

As related to public utilities, the exercise of unusual care in the separation of capital and revenue expenditures is of especial importance, for various reasons, some of which are:

1. The amount of the permanent investment in fixed capital is large as compared with the total investment, and therefore errors of accounting affecting the fixed-capital accounts become very serious.

2. Much of the material purchased may be used for either construction or maintenance.

3. A considerable part of the work in connection with which materials and labor are used involves reconstruction not chargeable to fixed-capital accounts, as well as betterments and additions chargeable to these accounts.

The importance of correct accounting as between capital expenditures and operating expense may be illustrated by the following incident, which was recently observed in connection with a rate-making proceeding before a state commission:

> A certain company doing an extensive business in generating and selling electrical energy, made an application to the commission for authority to increase its rates for service. It submitted statements of its revenues, expenses, capital account, and information on other pertinent matters. In these statements, the company had understated its operating expenses by over $100,000, which it had erroneously charged to "construction." Consequently, when calculation was made of the amount of gross revenue which would be required to pay the operating expenses, taxes, etc., and yield a fair return on the investment, the result was $100,000 below the correct amount. The result of this accounting was that the company asked for rates that would yield $100,000 less than the amount to which it was entitled.
>
> Had an accounting error of this amount been made in the other direction, operating expenses would have been overstated by $100,000. The company would have asked for unreasonably high rates, which, if granted, would have been unduly advantageous to the company at the expense of the consumer.

The actual amount measuring the injustice that would have been done had rates been based on a showing which included either one of the above-mentioned errors, would have been somewhat less than $100,000, as may be illustrated as follows:

> Assuming that a rate of return of seven per cent per annum be allowed on the investment, the amount received by the company for $100,000 in capital account for one year would be $7,000. If, on the other hand, the $100,000 were charged to operating expenses, and the company's showing for operating expenses was accepted by the commission, and rates based thereon, the company would receive $100,000 additional income in lieu of the $7,000 that it would have received if the $100,000 had been charged to capital account. The actual difference, resulting from this error, in the company's net income would, therefore, be $93,000 per annum. It thus appears that at the end of the year after the fixing of rates the company would have received fourteen times as much net income from a given amount included in operating expenses, as it would have received had the same amount been included in the capital account.
>
> Another feature of the incident just related was that the company could not issue stock or bonds to cover the $100,000 expended, because it was not properly chargeable to capital account. When at a later date application was made to the commission for authority to issue securities, this amount could not be allowed, as the commission could not, under the law, permit capitalization of the amount.

Cost of Supervising Additions and Betterments. - In the original construction of a public-utility plant, all expenditures necessary to produce a complete plant ready to begin operations, including the expenditures for franchise, organization, and other intangible items, are proper charges to the capital account. In connection with addition and betterment work, which is done while the plant is in operation, a question often arises as to what costs for supervision and other overhead expense should be charged to capital account. For instance, an engineer or superintendent, regularly engaged with operating duties, may devote a considerable amount of time to construction work. Usually a conservative policy will dictate that the capital account be charged and the operating account relieved only to the extent of the cost in excess of the normal operating cost of this character. Under ordinary conditions, however, there should not be charged to capital account such an amount as would reduce the operating cost below what would have been incurred if construction were not in progress.

In case a company's construction work is of a continuing character, necessitating a larger or more expensive supervisory staff than would be necessary to conduct operations alone, a reasonable proportion of the cost of such supervision should be charged to capital account. Of course, where an officer or employe devotes all of his time to construction work not involving maintenance, the total of his salary and incidental expense is chargeable to additions and betterments.

Capitalization of Unproductive Property.- Some writers on accounting and economics have strongly urged that property not directly contributing to earning capacity should not be capitalized. As applied to a public utility this would include the expenditures occasioned by public requirements, such as expenditures for paving, ornamental installations, and other things which do not enhance the earning power of the property. It is contended that such costs should be paid from appropriations of surplus, because the plant is worth no more for the purpose of making a profit than it was before. There is force to this argument, and in some industrial situations, and possibly also in rare cases in public-utility accounting, it should receive favorable consideration.

But in considering this question in connection with a public utility, it is well to examine somewhat further the status of the public-utility business and the aspects of the case as affected by the public interests. There are two principal sources from which the company can obtain funds. The first is thru the issue of securities, and the second, thru its own earnings. In any ordinary live community the utility is constantly growing, and therefore is constantly in need of additional funds for extension and improvements. For the most part, the money for these purposes must be obtained from new investors, or as additional investment from present investors. In neither case will moneys be forthcoming unless the outlook for earnings is reasonably good. It is necessary, therefore, that the company have earnings sufficient to meet its interest and dividend obligations. If, in addition thereto, earnings must provide further sums to pay the entire cost of improvements, which the public may demand, the rates to consumers must be raised accordingly. Thus there may be placed a very heavy burden upon the consumers of one period in order to provide betterments which will be of permanent value, and of as much advantage to the consumers of a remote future period as to those of the present. It therefore appears that a more just distribution of such expenditures is obtained by capitalizing it, thereby distributing the cost more equitably among all the consumers, present and future.

It is well to bear in mind in this connection that, unlike an industrial enterprise whose fortunes are dependent on various trade developments, which may result in a liquidation of the business, a public utility is inherently of a permanent character. This permits the distribution of costs to more remote periods, where such distribution is preferable for cost purposes, or from a public-policy viewpoint, which is here involved.

A business less permanent in character, in order to safeguard its capital investment, must provide against severe business reverses by building up, out of its earnings substantial reserves, or by writing off its assets to the amount realizable on liquidation. This will often justify the charging of certain items of expenditure to surplus, rather than capitalizing it for gradual distribution over a period of years.

Accounting for Additions and Betterments.- The difficulties in connection with accounting as between capital accounts and operating expense naturally occur in connection with additions and betterments made during the progress of operations. In connection with additions of definite units not involving the retirement of any property, the principal accounting requirements are accuracy in charging materials used to specific additions and in properly accounting for the time of the supervisory staff and of laborers.

The accounting in connection with betterments, however, often involves the retirement of certain property and its replacement by other property. If the accounts are kept in such manner as will show the cost of all units of property, so that the amount to be eliminated from the fixed-capital accounts upon retirement of each item of property may be determined, the accounting for retirements and the proper adjustment of the capital accounts should not present serious difficulties. This is particularly true when the items can be readily individualized; as for instance, the retirement of a boiler, or of an entire plant.

The amount to be charged to capital account in case of a direct replacement of an entire plant, or of a particular unit, is the cost (including cost of installation) of the unit taking the place of the one retired, the cost of the retired unit being deducted from the capital account.

Rule for Capitalizing Replacements.- While occasionally an entire plant is retired and replaced, it is usual for retirements to be made gradually, the retirement occuring in the process of reconstructing, extending, enlarging, rearranging, or otherwise altering the central plant or distribution system. The rule applicable to such situations is stated in the general instructions pertaining to fixed-capital accounts in the National Association Classification of accounts, as follows:

> "When any replacement takes the form of reconstructing or converting existing property in such a way that the cost of the entire project cannot be accurately assigned as between the cost of putting in the new property and the cost of taking out the old, no greater proportion of the cost of the project shall be charged to fixed-capital accounts than would equal the cost of new plant or equipment having equivalent capacity and expectation of serviceable life. Such part of the cost of a reconstruction project as is not chargeable to fixed capital shall be considered a retirement loss and charged to the "Retirement Reserve" or to "Property Abandoned," as already provided."

If the principles embodied in this rule are applied with proper consideration of all circumstances in each case, the result should be a reasonably correct division between capital accounts and expense.

Taxes During Construction.- Taxes accruing against public-utility property during the construction period should be capitalized. The question of a proper division of taxes as between the construction and the operating periods usually involves no difficulty, as the basis of the charge to construction account should be determined by the time elapsed before the completion of construction, compared with the total period to which the taxes apply.

Salvage from Construction Equipment, Tools and Materials.- When the cost of construction equipment, tools, or materials and supplies has been charged to the fixed-capital accounts and the entire value thereof has not been consumed upon completion of the work, the residual value of such equipment, tools, or materials and supplies should be credited to the accounts to which originally charged, and concurrently charged to materials-and-supplies account or other appropriate accounts.

Improvements on Leased Property.- The question as to what constitutes a proper charge to capital accounts may sometimes be raised in connection with improvements made on property held under lease. The rule usually applied is that, if substantially the full benefit of such improvements will be obtained before the expiration of the lease, the cost thereof may be charged to the capital account, and depreciation and retirements of such property treated in the same manner as on property owned. However, in case the full benefit will not be obtained by the lessee because of reversion to the lessor at the expiration of the lease, the cost of improvements should be charged to a suspense account, and cleared by uniform charges to rent-deduction accounts within the period of the lease.

While this rule is in accord with sound accounting principles, and should usually control, situations arise in which the rule must be applied with due regard to the existing circumstances. There may arise situations in which capital accounts are benefited thru expenditures of this kind, and if they result in lessening the cost of performing work chargeable to capital accounts, proper consideration should be given to the extent of such benefits.

Expenditures made by lessee for which the lessor is required to reimburse the lessee prior to the expiration of the lease should not be included in the fixed-capital accounts of lessee.

Discount on Bonds Chargeable to Capital Account. - With few exceptions, the accounting rules prescribed by regulatory commissions treat discount on bonds and other forms of indebtedness as being in the nature of interest paid in advance. It is provided that the amount of the discount shall, at the time of the issue of bonds, be included in a balance-sheet suspense account and amortized by periodic charges to the income account. In this way the income account will reflect, for each period during the life of the bonds, the amount of discount applicable to the period. The rules contained in the classifications of both the National Association of Railway and Utilities Commissioners and the Interstate Commerce Commission, provide for the amortization of discounts as above outlined.

Aside from the matter of obtaining a distribution of the discount to various accounting periods, there are objections to including the entire amount of discount in the capital accounts, as was formerly the practice. One of these objections is that as bonds are issued for a limited period, other bonds are later issued to redeem the first issue and are liable to be sold at a discount. If the discount on both issues were permitted to be capitalized, it would eventually result in building up quite a substantial sum in the plant account for which no property was in existence. Another objection arises from the fact that the amount of the discount depends largely on the rate of interest which the bonds bear, and by raising or lowering the rate of interest the discount is automatically controlled. This makes it evident that the discount is a financial expense. For instance, a company might issue a 4 per cent bond at a discount of 20 per cent, while a 5 per cent, 6 per cent, or 7 per cent bond could be sold at par or more. The amount, therefore, that would be charged to capital account in respect of discounts would be determined merely by regulating the rates of interest on the bonds.

Projects Abandoned.- Construction projects which are undertaken and abandoned, and also preliminary surveys made in connection with projects which are not completed, should receive very careful consideration. The accounting rule provided in the Interstate Commerce Commission classifications is that in such cases the amount expended shall not be charged to the capital accounts, but shall be charged to profit and loss, or the surplus account. The National Commissioners' classification provides that such expenditures shall be carried in miscellaneous Deferred Debits account until proper disposition can be made; that if the projects are abandoned, the cost of the preliminary investigation shall be "charged to the appropriate operating expense or other account ." Fixed rules should not be arbitrarily applied, however, but should be used with reason and due consideration to the circumstances existing in particular cases.

Capitalization of Limited-Period Franchises and Rights.- It is generally recognized that the actual cost of obtaining franchises may properly be capitalized, notwithstanding the fact that the majority of franchises are for a limited period. The rule prescribed by most of the state commissions and also by the Interstate Commerce Commission provides that property having an expected life in service of more than one year may be included in the fixed-capital account. This applies to such intangible items as franchises and rights, as well as physical property. It is very important, however, that the cost of limited-term franchises, and all other rights and leaseholds of limited terms, should be amortized before the date of their expiration. The cost of franchises is likely to receive careful scrutiny by commissions, and under some conditions capitalization may not be permitted.

Reader's Test of Subject Matter in Chapter IV

The following questions are given to enable the reader to check himself as to his grasp of the important points discussed under the subject "Capital and Revenue Expenditures."

1. State at least four reasons why it is important to make a careful separation of capital and revenue expenditures.
2. The services of engineers, draftsmen, and superintendents are regularly employed on the operations of a certain utility. New construction is planned, and a part of such time is devoted to the preliminary construction work. How would you distribute the cost, and which account in Figure 2 would you use for charging such items?
3. Expenditures for paving, ground improvements, etc., do not enhance the earning power of property. What should be the procedure in regard to such costs?
4. A turbo-generator unit which cost $20,000, for which a retirement reserve of $12,000 has been provided, is being replaced by a new unit, having the same capacity, which now costs $30,000. Outline the accounting procedure for this transaction.
5. What is the rule of the National Association of Commissioners with reference to capitalizing replacements?
6. If there are any tools, equipment, or materials which can be salvaged from a construction job, what procedure would you follow?
7. Suppose that a certain utility made improvements costing $25,000 on property which has been leased and the lease has still a life of 20 years. How would you handle the cost of improvements?
8. If a bond issue of $500,000 is sold for $490,000, and the proceeds are used for the construction of an addition to the gas plant, what would you do with the discount of $10,000 which the company suffered to market the bonds?
9. If a piece of construction work which cost to date $100,000 is to be abandoned and never completed, to what account would you charge this cost?
10. What is the rule of the Interstate Commerce Commission with reference to capitalizing limited period franchises and rights?

CHAPTER V

DEPRECIATION AND THE RETIREMENT OF PROPERTY

....

The essential points brought out in this section are briefly summarized in the following:

1. Depreciation is not to be confused with shrinkage in value resulting from changing commodity price levels.
2. Two views of depreciation are discussed:
   (a) Depreciation as loss of capital values.
   (b) Depreciation as an operating charge against income.
3. Depreciation charges as advance payment on maintenance costs.
4. Two opposing conceptions of depreciation are discussed:
   (a) Depreciation related to efficiency of operation.
   (b) Depreciation related to investment values.
5. Three methods of computing depreciation are explained and important principles discussed:
   (a) Straight-line method.
   (b) Sinking-fund method.
   (c) Retirement-loss-equalization method.
6. National Association of Commissioners' Classification of Accounts is explained with reference to retirement expense and retirement reserve.
7. Property-abondoned account relates to the accounting for losses not anticipated by a provision in retirement reserve.
8. The extent to which retirement losses should be anticipated is discussed.
9. Depreciation of property results from various causes, the effect of which cannot be foretold.
10. Court decisions are quoted regarding depreciation or retirement losses.
11. Opinions of utility operators and regulatory commissions regarding the treatment of retirement losses are stated.
12. The errior of using two or more methods of computing depreciation for a given property is discussed.
13. Decisions of several state commissions are quoted and explained.
14. To provide the amount of income necessary for the upkeep of property, regulatory commissions frequently determine the combined maintenance and retirement expense without naming specific percentages for depreciation charges.
15. Some characteristics of the public-utility business which affect the provision for depreciation are discussed.
16. Summary of discussion of depreciation and the retirement of property.

DEPRECIATION CONTRASTED WITH DECLINE IN MARKET VALUES

In the literature relating to public utilities, the word "depreciation" probably has been used to express a greater variety of ideas, conceptions, and theories, associated with characteristics, conditions, and economic considerations affecting public-utility property, than has any other word in our vocabulary. However, it should be observed that, notwithstanding the numerous meanings associated with the word, it is employed in a somewhat restricted sense when used in connection with public-utility property. As here used, it does not represent a depreciation or shrinkage in value which results from changes in commodity price levels.

A single piece of equipment might be purchased to-day for less than was paid for a similar unit now forming a part of an operating plant, but the difference between the price paid for the unit and that for which it could now be replaced is not "depreciation" in the sense in which commonly used. The difference between the cost of such unit when acquired and its present value, without consideration of any changes in price levels, is designated "depreciation."

Relation of Depreciation to Capital and Income.- Two phases of so-called "depreciation," between which there is a fundamental difference and at the same time a very close interrelationship, are (1) depreciation in the sense of loss of capital value, and (2) depreciation as an operating charge against income. These may be somewhat more fully stated as follows:

1. Loss of capital values.- A lessening of value or worth of property resulting from physical deterioration or loss of actual or potential service value or usefulness. Such loss may result from (a) wear and tear or use. (b) action of the elements, (c) supersession thru improved types of devices (obsolescence), (d) insufficient capacity to meet increased demands for service (inadequacy), and (e) public requirements necessitating the discarding of property before exhausted in order to satisfy a demand for the installation of what is considered by the public as improved - perhaps safer or more ornamental - facilities.

2. Charges against income.- The word "depreciation" has also been very widely used in connection with provisions made out of income for the writing off or amortization of property when its useful life ceases, such provision being more commonly made before the retirement of property, tho advance provision is not always desirable, practicable, or necessary. The amounts set aside out of income and reserved to apply on the purchase of replacements when the retirement of various units of plant and equipment becomes necessary, have commonly been designated as "depreciation." The charge against income is usually included in a specific account in the group of operating-expense accounts, this specific account being designated "depreciation charge." "depreciation allowance," "allowance for accruing depreciation," or simply "depreciation." Concurrently with the making of such charge a like amount is credited to a balance-sheet account frequently designated as "depreciation reserve," "reserve for accrued depreciation," or some similar name. If the amount represented by such charges is segregated from the company's general cash and kept in a special fund, such fund has been designated "depreciation fund" or some similar term.

Many features of the above outline will be more fully defined and analyzed, but it is important that, as we proceed, the distinctions here indicated be clearly borne in mind. So abundant and varied have been the ideas advanced as to various aspects of each of these two general divisions of the subject, and so frequently has lack of understanding been manifest as to the relationship existing between depreciation as related to property values and as related to income, that quite confusing statements are encountered even in important court decisions.

Retirement Expense Substituted for Term "Depreciation" - There are many intricate problems connected with the whole subject, but undoubtedly much confusion has resulted from the use of the word "depreciation" without adequate qualification. An effort has recently been made to clarify the situation by eliminating "depreciation" from public-utility accounting terminology and substituting the term "retirement expense" to represent the charge to operation, and the term "retirement reserve" to represent the reserve created. These terms are employed in the classification of accounts for electric, gas, and water utilities recommended by the National Association of Railway and Utilities Commissioners, the word depreciation being nowhere used in these classifications. The adoption of these terms should be helpful in avoiding some of the confusion resulting from the use of "depreciation" in so many relations, however, as "depreciation," with or without qualifying adjectives, is used in court and commission decisions and discussions to which references will be made, the term will be used frequently in this treatise. Where used, except in quotations, it will be with the same meaning as "retirement expense" when referring to a charge against income and with the same meaning as "retirement expense" when referring to the reserve.

Some observations are pertinent at this point as to the procedure followed with reference to charges made to income thru operating expenses for depreciation or retirement expense, and as to certain general considerations affecting the relationship existing between such charges and other charges made for the upkeep of property, commonly referred to as "maintenance."

Depreciation Charges as Advance Payment on Maintenance Costs. - The cost of maintenance or upkeep of the property, in order to keep it in condition to render efficient service, is a proper charge to income, the charge usually being made by including it as a part of the operating expense. Such cost may be divided in a general way into two classes, one of which is designated "repairs" or "maintenance," sometimes referred to as "current maintenance," and the other as "retirement expense," or so-called "depreciation" charges. There is no fundamental difference between these two classes of expense, the distinction being made as a convenience for accounting purposes.

One writer has stated that the difference between "repairs" and "depreciation" is that repairs are items that are chargeable against the income of the year in which the repairs are made, while depreciation is a charge against the income of several years. That this is not a practical distinction in public-utility accounting will be realized when it is recalled that a large amount of "repairs" actually represents the replacements of parts whose exhaustion cannot be said to result from service in any one year. For instance, replacements of cross-arms on pole lines and of railroad ties are generally charged as repairs during the year in which replaced, altho the wear and decay that made the repairs necessary extended over several years. If renewals and replacements of all classes of property occurred with regularity, so that the charges therefor would not fluctuate greatly from year to year, there would be little occasion for the distinction between "current maintenance" and "depreciation" or "retirement expense." But some items of equipment must be replaced in a relatively short time after being placed in service, while others, such as buildings, may remain in service for a long period of years. The units of property having a long life are, to a large extent, units of such size that quite large expenditures are involved. Consequently, if no provisions were made for equalizing the cost resulting from their exhaustion in service, the operating expenses would be abnormally high in years during which it became necessary to replace a number of the larger units and would be low in years during which but few major replacements are made.

In recognition of the desirability of equalizing such expenditures so as to prevent wide fluctuations in the operating expenses, and, further, to guard against impairment of the investment and to prevent interference with service to the public thru inability to make proper renewals, it has become a fairly general practice to make financial provision for the retirement of the major units of property prior to the date of retirement.

This provision is made by means of annual charges to income, so far as practicable, during the years in which the property is rendering service. In some cases, as we shall hereafter see, the charges to expenses are made after the property goes out of service, but such cases are more likely to occur where property is retired before the expiration of its normal life because of a casualty or in order to replace it with some new and superior type. Rapidly developing demands for increased service in the community require the retirement of facilities because of their inadequacy.

Lest misunderstanding should result from the phrase "provision for replacement and renewals" and "provision for retirement losses" as used in various places in the discussion of this subject, it should be borne in mind that there is general agreement, even among those advocating different theories and methods as to these matters, that the original cost of all retired property should be deducted from the fixed-capital accounts, and its cost, after allowing for salvage, cost of removal, etc., charged against the depreciation reserve or retirement reserve, whichever name is used.

Altho the reserve indicates the provision made for replacements, the cost of the replacements is not charged against the reserve. Its purpose is to show the amount of money reserved from earnings to provide for the acquisition of new property, which amount theoretically should be the same number of dollars as the cost of property retired (less salvage). In other words, the amount of money available to purchase new property to replace the old should be the amount which the reserve indicates has been set aside, plus cash received from the salvage of the property retired. In theory, the sum of these should equal the investment in or cost of the old property. Any excess cost of the new property over the cost of retired units is charged to fixed-capital accounts, the money necessary to cover such excess being provided from sources not related to the depreciation reserves.

Purpose of Depreciation or Retirement-Expense Charges.- In the constantly recurring discussions concerning the valuation and revaluation of public utilities, and other factors relating to rate making, there is often an evident confusion as to the relationship existing between depreciation as related to valuation, or loss of value, and depreciation as related to the operating expenses and income account. This relationship will be taken up in a later discussion. At this point, however, it may be observed that the failure to recognize the relationship between these aspects of the subject is probably largely responsible for considerable argument that has arisen as to the purpose of "depreciation" or "retirement expense" charges against income. Two seemingly contradictory propositions are advanced, which may be stated as follows:

1. Depreciation reserves are provided solely for the purpose of maintaining productive capacity and operating efficiency, and not for the purpose of maintaining values in a property.

2. Depreciation reserves are provided for the purpose of maintaining values, and not for the purpose of maintaining productive capacity or operating efficiency.

We shall examine these two conflicting statements of purpose in order that we may observe in what way and to what extent they lead to different results with reference to the valuation of property and its revenue requirements.

Depreciation as Related to Efficiency of Operation.- Reflecting the view that the fundamental purpose of a depreciation reserve is to maintain capacity for production and efficiency of operation are expressions of the National Electric Light Association, the American Gas Association, and the State Railway Commission of Nebraska.

The standard classification of accounts adopted by the accounting section of the National Electric Light Association, in 1914, contains the following:

> "The words 'Depreciation' and 'Amortization' should not be used in connection with the accounting systems of public utilities. Depreciation means to lessen the price of, lower the rate of, to sink in estimation, fall in price or value, become of less worth.
>
> "Amortization means to wipe out, to extinguish. No company desires to wipe out or extinguish its property. On the contrary, its sole aim is to maintain the productive and operating efficiency of its property at its maximum by renewing parts displaced for any cause."

A uniform system of accounts for gas utilities recommended by the Accounting Committee of the American Gas Association, in 1914, provides for a reserve to be created and maintained by means of charges to operating expenses based on "the estimated proportion of the average annual cost of maintenance and replacements of tangible property necessary to maintain the property in good, efficient, working condition."

The position of the representatives of the American Gas Association on the subject of depreciation appears to have been substantially the same as that of the National Electric Light Association, as expressed in its classification of accounts adopted in the same year, 1914, namely, that "depreciation" charges should be made solely with reference to the maintaining of capacity and operating efficiency.

Recent statements, in behalf of the electric light and power utilities and the gas utilities, which we quote at some length under "Position of Utility Operators on Treatment of Retirement Losses," shows that they still adhere to the views above expressed.

Resembling very closely the above-stated views that "depreciation" is purely a question of renewals and the assurance of efficient operation, are certain statements made by the Nebraska Railway Commission in the Commission's Uniform System of Accounts for Telephone Companies, effective February 15, 1919. The following are excerpts from the text of "Depreciation Reserve Account," as provided in the Nebraska classification.

> "The word depreciation, as used in this book of instructions, is a word intended to represent the loss in operating efficiency of a telephone property from any cause whatsoever, such as wear and tear, obsolescence, public regulation, changes in the art, or any other cause which tends to depreciate the working efficiency of any part of a telephone system.
>
> "It is not for the purpose of maintaining values in a property that depreciation reserves are set up, but for the purpose of continually maintaining all of the component parts of a plant."

Depreciation as Related to Investment Values.- In contrast with the foregoing statement of views, the following appears in the Interstate Commerce Commission's classification of Operating Expenses for Steam Railroads, effective July 1, 1907:

> "The question of depreciation is fundamentally a question of values, and not a question of maintaining the original capacity, or a standard of operating efficiency, or of keeping full the numbers in equipment series."

In 1909, the Supreme Court of the United States, in its decision handed down in City of Knoxville v. Knoxville Water Company, 212 U. S. 1, said:

> "A water plant, with all its additions, begins to depreciate in value from the moment of its use. Before coming to the question of profit at all, the company is entitled to earn a sufficient sum annually to provide, not only for current repairs, but for making good the depreciation and replacing the parts of the property when they come to the end of their life. The company is not bound to see its property gradually waste without making provision out of earnings for its replacement. It is entitled to see that from earnings the value of the property invested is kept unimpaired, so that at the end of any given term of years the original investment remains as it was at the beginning. It is not only the right of the company to make such a provision, but it is its duty to its bond and stock holders, and, in the case of a public-service corporation at least, its plain duty to the public. If a different course were pursued the only method of providing for replacement of property which has ceased to be useful would be in the investment of new capital."

The statement that it is not only the right of the company to provision for replacements but its plain duty to its bondholders, and that it is, as well, its duty to the public to make such provision, leaves no room for doubt as to the court's view that depreciation charges have a relation to investment values and makes it equally clear that a duty to the public is involved. The duty which the public utility owes to the public is that of making provision sufficient to assure its ability to give adequate, continuous, efficient service. To assure the fulfillment of this obligation, it is necessary that provision be made for renewals of property when exhausted. It should be noted that the court asserts the duty of protecting the investor and the duty of protecting the public. In declaring the purposes to be accomplished and the means of their accomplishment, the court evidently did not consider that there was anything antagonistic in the utility's rights and the public's interest, or anything requiring a difference in the processes by which the purposes were to be achieved. "Provision out of earnings for its replacement" is what the court holds is to be the means employed.

Methods of Computing Depreciation or Retirement Expense Charges. - As a result of the different viewpoints as to the purpose of depreciation charges, different proposals are put forward as to -

1. The extent to which provision should be made for depreciation or retirement losses in advance of their occurrence.
2. The methods by which the required amounts are to be determined.

The annual amounts considered necessary vary materially under the different plans proposed for calculating the allowance. The principal points of controversy as to the amount to be provided annually by charges to income and the method of its ascertainment may be considered under the following heads:

1. Straight-line method:
   The theory employed under this method is that at the date of installation of each piece of plant machinery and equipment, its length of life in service can be foretold, and a determination made of the loss of value during each year that it shall remain in service.

2. Sinking-fund method:
   This method proceeds in the same manner as the straight-line method, but differs to the extent that part of the annual sum required is made up from interest on past accumulations, making the direct charge to income correspondingly less.

3. Retirement-loss equalization method:
   This method contemplates that a reserve shall be provided "sufficient to cover all retirement losses that may reasonably be expected."

Discussions of this subject frequently refer to the "replacement method" of counteracting depreciation. This, however, simply relates to the process of charging all replacements direct to operating expense. This procedure does not involve any so-called "depreciation accounting" or reserves, and therefore requires no discussion except as to its use in combination with the methods above mentioned, all of which require reserves for part of the cost of maintenance, the remainder being charged direct to operating expense when repairs and replacements are made.

A comparison of the different methods of providing for depreciation or retirement losses and of the position taken with reference thereto by various public utility groups and regulatory authorities will be now made.

Straight-line Method. - The court's language in the Knoxville case, to which reference has been made, is quoted with approval by the Interstate Commerce Commission in its valuation report on Texas-Midland Railroad (issued July 31, 1918, Valuation Docket No. 2), as authority for its finding that depreciation covers loss of capacity for use due to age, inadequacy, etc. This report further states:

> "As treated by the Commission, depreciation may be defined as the lessening in cost value due to the smaller number of service units in the property as found, than in the same property new. An article when new, contains, so to speak, a certain number of units of service as those units are exhausted the article depreciates. When they are all used up the service life ends.
>
> "It is assumed that the loss of these units of service is evenly distributed thruout the entire life of the article. In point of fact, this is not exactly true. Some articles may depreciate more rapidly in the early years of service and others in the last years, but the practical way is to assume that the loss is uniform, and it is believed that this as applied generally will produce a fair result."

The theory expressed in the Texas-Midland Railroad case as applied in depreciation computations is what is known as the "straight-line" method. Its theory requires that with reference to each piece of property that is treated as a unit for accounting purposes, there shall be made at the time it goes into service, an estimate of its probable life in service. An estimate is also made of its salvage value if it is expected to have any salvage value at retirement. During each year of its life a charge for depreciation of the unit must be made based upon its original cost, less the estimated salvage. The cost of the unit, less estimated salvage, is divided by the number representing its estimated life in years. The figures resulting from this division are used as a charge to operating expenses for depreciation during each year of the life of the unit, provided its actual life should correspond with the estimated life.

For a simple illustration, we may take the case of a pole installed at a cost of $10.00, estimated to have a life of 10 years. We will assume that there will be no salvage. In this case a charge to operating expenses of $1.00 will be made each year for 10 years. At this point, however, we encounter some difficulties which seriously interfere with the apparent mathematical precision of this method. The pole may remain in service 15 or 20 years, or, because of fire, storm, or other cause, it may go out of service in much less than 10 years. If the theory is accurately applied, no further charges for depreciation shall be made with respect to the pole after its cost shall have been provided for, which would be at the end of 10 years. If the pole should live 20 years, no charges would be made during the last 10 years of its existence. If it should go out of service in five years the amount provided by depreciation charges would be equal to only half of its cost.

We will not go further into the difficulties which are apparent in connection with this illustration, for the reason that, as a matter of practice, poles and other classes of property embracing many thousands of units in a company's fixed-capital accounts are not accounted for item by item so far as depreciation charges are concerned; for instance, in the telephone business one composite rate for depreciation is made for all kinds of equipment included in the account "Exchange Pole lines." Telephone accounts are here referred to, for the reason that the telephone industry reprensents practically the only advocate of the "straight-line" method among public-utility operators, and we would, therefore, expect to find in their accounts, if anywhere, a correct application of the theory.

This account includes not only poles of many different kinds and sizes, but includes towers, cross arms, pins, brackets, braces, guy wire, guy stubs, and other materials used in the construction of exchange service pole lines; also the cost of first clearing right of way. Investigation by the writer, as well as evidence before various commissions, shows that no records are kept of the life of any of these individual units. An estimate is made by some representative of the company that the life of the unnumerable items of various kinds appearing in this account is a certain number of years. This is said to represent average life. As no actual tabulations are made of individual life of any units the so-called "average life" is in fact only a guess.

An objection which has been made to the straight-line method is that it returns to the company more than sufficient to cover the original cost of the property. For instance, in the case of the pole referred to in the foregoing illustration, the company would receive $1.00 during the first year and would add $1.00 each year to and including the 10th year. It would have the use of this money without paying interest, or could loan it and receive interest thereon until required for the purchase of a new pole at the end of the 10th year. If interest were compounded annually at 5 per cent on the balance in the reserve each year, a charge to operating expenses of 79½ cents, instead of $1.00 per annum, would be sufficient to provide the total cost of the pole ($10.00) at the end of 10 years, when a new pole is required. The amount collected from the consumer for depreciation in the 10-year period would then be $7.95, while the interest would amount to $2.05, making a total of $10.00. A method which gives consideration to interest earnings has been worked out and in a large number of specific cases has been used, sometimes with modifications, by regulatory commissions in dealing with rate cases. This method is known as the "sinking-fund" method, which will be briefly explained.

Sinking-Fund Method. - The sinking-fund method proceeds in the same manner as the straight-line method, using estimated life and estimated salvage in connection with the cost of the property for which the computation is made. Under this method; however, the computation of the annual charge for depreciation is based on the theory of actually setting aside in each year a certain amount of cash which will be invested with interest compounded at a certain rate, so that at the end of the time estimated to be the life of the particular unit a fund will have accumulated equal to the original cost, less salvage.

In addition to the unknown quantities of life and salvage involved in estimating the depreciation charge under the straight-line method, one more uncertainty is added by the sinking-fund method. The amount of interest to be earned on the fund must be estimated. It is impossible to estimate accurately the interest that should be obtained over a period of years. The desired sum, therefore, will not be available at the end of the estimated life of the property, unless periodical adjustments are made.

Under the sinking-fund method the annual earnings from interest accruing to the fund increase in amount each year, as the balance in the fund increases. The total annual accretions to the fund during the later years, therefore, are larger than those of the earlier years. The direct-depreciation charge to operating expenses remains constant, while the interest added to the fund increases annually. Consequently, the amount of the fund at any time before its use is required for replacements would be less under the sinking=fund method than under the straight-line method.

Under such conditions, if replacement of the units is necessary sooner than estimated, the discrepancy between the amount required for their retirement and the amount actually accumulated with respect to such units would be greater under the sinking-fund method than under the straight-line method.

A modification of the sinking-fund theory, which has been used to some extent, consists of computing the charge in the manner usually followed under this method, without actually creating a fund on which interest may be received. This method proceeds on the theory that it is more advantageous for the company to use the moneys reserved for depreciation for the purpose of making additions to its property instead of investing the money at a low rate of interest and paying a higher interest rate for money which it would have to borrow or obtain otherwise for the additions to its plant. In such cases it is assumed that the money so invested produces earnings thru the company's operations and that all or part thereof should be credited to the reserve. In some cases an interest rate of 4, 5, or 6 per cent has been determined upon as representing the amount that should be added to the theoretical reserve. The following tables compare the results under the straight-line method and the sinking-fund method.

Straight-Line Method Illustrated. - Assumptions: Investment, $1,000; service life, 10 years.

	Depreciation charged to operating expenses.	Accumulation of depreciation accruals
End of-		
1 year	$ 100	$ 100
2 years	100	200
3 years	100	300
4 years	100	400
5 years	100	500
6 years	100	600
7 years	100	700
8 years	100	800
9 years	100	900
10 years	100	1,000
Total	$1,000	

Sinking-Fund Method Illustrated.- Assumptions: Investment, $1,000; service life, 10 years; interest, 5 per cent.

	Annual Charges to Operating Expenses	Interest Accumulations	Depreciation Accruals	Accumulation of Depreciation Accruals
End of-				
1 year	$79.50	$.........	$79.50	$79.50
2 years	79.50	3.98	83.48	162.98
3 years	79.50	8.16	87.66	250.64
4 years	79.50	12.53	92.03	342.67
5 years	79.50	17.14	96.64	439.31
6 years	79.50	21.97	101.47	540.78
7 years	79.50	27.05	106.55	647.33
8 years	79.50	32.37	111.87	759.20
9 years	79.50	37.97	117.47	876.67
10 years	79.50	43.83	123.33	1,000.00
Total	$795.00	$205.00	$1,000.00	

The above table, illustrating the sinking-fund method, shows the total of the annual charges for depreciation to be $795, and that the additional $205 necessary to make up the $1,000 is derived from interest on the accumulations for the period. It is apparent that the amount necessary to be charged to operating expense accounts under the straight-line method is 25.8 per cent more than is required under the sinking-fund method.

The added charge made against the consumer under the straight-line method as compared with the sinking-fund method has frequently been considered by commissions in connection with the valuation of utility property for the purpose of establishing the rate base. It is held that a reserve accumulated under the straight-line method gives the consumer no benefit from the interest earnings on the accumulated reserve; that the sinking-fund method fully protects the investment and that no greater amount than required for this purpose can justly be asked from the consumer thru income.

In further explanation of this treatment of depreciation reserves accumulated under the straight-line method, it may be said that the reserve itself covers the full original cost of the property, and that the interest earnings, being an amount in excess of such cost, cannot be considered as a part of the return to the company of the original cost of its property. It is not required, therefore, to meet depreciation losses. By omitting from the rate base, thereby giving the customers the use, without interest, of the property acquired from moneys collected for depreciation, when the collection is by the "straight-line" method, approximately the same results are accomplished as under the "sinking-fund" method, by which interest is considered in determining the depreciation charge against the consumer. In describing these results as approximately the same, it should be remembered that the degree of approximation will depend upon the difference between the interest rate used in sinking-fund computations and the rate of return obtainable from the operation of the property. Under the same rates the results would be the same, but if the sinking-fund interest is computed at, say, 5 per cent, and net income from operation of the property is 8 per cent, there will be a decided advantage to the consumer thru obtaining the use of property worth 8 per cent instead of sinking-fund interest at 5 per cent.

Some commissions, while adopting the principles above outlined, have held that the consumer is not entitled to credit for more than the rate of interest that an actual fund safely invested would produce, and that the excess which the company might earn by employing the money for the acquisition of property for use in its own operations should accrue to the company for the administration of such property.

Rate of Return Affected by Investment of Depreciation Funds.- Consideration of the correct treatment in a rate case of property acquired by the use of depreciation-reserve moneys involves some questions of law, finance, economics, and public policy which cannot be here introduced. It is, however, pertinent to note the effect on the rate of return on the full property in service, compared with the rate of return of the original investment, excluding the property acquired from depreciation reserves. In this illustration the reserve is built up on the straight-line method. The figures used show the plant account and the operating results during a year when the reserve has reached the point where it is 40 per cent of the original cost of the property.

Illustration showing effect of reinvested reserves in computing rate of return:

Original capital provided by investors..........	$100,000
Additions to property from depreciation moneys...	40,000
Total property in service..................	$140,000
Operating revenues (annual)....................	$ 35,000
Operating expenses (including depreciation)......	24,500
Net Income..................................	$ 10,500
Return computed on total property in service,.... ($10,500 ÷ $140,000),....................	7.5%
Return computed on original capital,............ ($10,500 ÷ $100,000)......................	10.5%

Retirement Loss Equalization Method.- The term "retirement expense" as used in the uniform classification of accounts approved by the National Association of Railway and Utilities commissioners expresses more accurately than does the word "depreciation" the idea underlying all accounting, which aims to recognize and provide the reservation of income for the losses due to exhaustion of property which are realized upon the occasion of its retirement. The word "depreciation" is a broader term and has been used somewhat loosely, both in connection with losses in investment values and in connection with the charges against income intended to provide for retirement losses. The "retirement loss" is a definite amount which represents the difference between original cost plus cost of removal and salvage value.

The term "retirement" has been used for many years by the

Interstate Commerce Commission as a title for operating-expense accounts of steam railroads, in which is included a part of the expense usually included under the head of "depreciation" or "retirement loss." The accounting rules of the Interstate Commerce Commission, adopted in 1914, permit charges to "retirements" representing such part of the loss on equipment as is assignable to the period subsequent to July 1, 1907, but only so far as it has not been provided for in the depreciation reserve.

It is apparent, therefore, that in the railroad accounts retirement losses are divided into two parts, one of which, representing depreciation accrued since 1907, provided for in the depreciation reserve, is charged to depreciation reserve, and the other, representing depreciation accrued since 1907, not provided for in the depreciation reserve, is charged to operating-expense account "retirements." The cost of demolishing equipment is also charged to the "retirements" account. The classifications of accounts of the National Association of Railway and Utilities Commissioners does not make this division, but permits charging both classes of retirement losses, and also the cost of dismantling or removal to retirement reserve.

Retirement Reserve.- The purposes to be accomplished by creating and maintaining a retirement reserve are stated in the Uniform Classification of the National Association of Commissioners, as follows:

> "An account is provided in which to include charges made in order that corporations may, thru the creation of adequate reserves, equalize from year to year, as nearly as is

> practicable, the losses incident to important retirements of buildings, dams, etc., or of large sections of continuous structures, like electric line, or of definitely identifiable units of plant and equipment. Losses used above means in each case the excess of the original cost to the accounting company of the property retired, plus the cost of dismantling or removing, over its salvage value at the time of its retirement. The cost of replacing minor parts, which is not recorded by any entries in the fixed-capital account, and which is commonly called the cost of 'repairs' or 'maintenance, as distinguished from the cost of 'replacements' of large units, need not be provided for thru a retirement reserve. The amounts charged to retirement expense, plus amounts appropriated from surplus, should be upon a basis determined to be equitable, according to the accounting company's experience and best sources of information, and should in all cases be sufficient to provide during a period of years a reserve against which can be written off all losses sustained upon the retirement of property for any cause whatsoever."

The text of the account, "retirement reserve," in the Commissioner's classification, reads:

> "To this account shall be credited such amounts as are charged to Operating-Expense Account Retirement Expense', appropriated from surplus, or both, to cover the retirement loss represented by the excess of the original cost, plus cost of dismantling, over the salvage value of fixed capital retired from service. When any fixed capital is retired from service, the original cost thereof (estimated if not known, and where estimated, the facts on which the estimate is based should be stated in the entry) should be credited to the proper fixed-capital account and charged, plus the cost of retirement, less salvage, to this account. If the credit balance in this account is insufficient to cover the retirement loss, the excess over the balance contained in the reserve should be charged to Account No. 132, 'Property Abandoned,' or other appropriate account.
>
> "The losses which this account is intended to cover are those incident to important retirements of buildings, of large sections of continuous structures, like electric line, or of definitely identifiable units of plant or equipment, and the purpose of the account is that the burden of such losses may be as nearly as practicable equalized from year to year, but with due regard for amount of earnings available for this purpose in each year."

Some of the state commissions in adopting the uniform classification amended that portion of the second paragraph which permits the amounts charged for depreciation to be made dependent upon the earnings available. Such amendments were made, either on the ground that the proper provision should be made in each period regardless of the earnings available, or because the matter should be covered by instructions given in specific cases, rather than by a general rule of the Commission.

The text of the account, "Retirement Expense," is as follows:

> "This account shall include such amounts as the accounting company charges to operating expenses, in addition to appropriations from surplus to retirement reserve, to provide a reserve against which may be charged the original cost of all property retired from service, plus the cost of dismantling, less salvage. The amounts charged to this account or appropriated from surplus and credited to the 'Retirement Reserve' shall be, in addition to the necessary costs of keeping the plant and equipment in a high state of efficiency, thru charges to the regular maintenance accounts.
>
> "It is the intent of the classification that a reserve shall be provided, either thru retirement expense or by appropriations from surplus, or both, sufficient to cover all retirement losses that may reasonably be expected."

The foregoing quotations contain the full text of the instructions relative to "Retirement Reserve" account and "Retirement Expense" account. There are five accounts relating to the accounting for depreciation or retirement losses. The following are the titles and brief statement of the nature of each account, with the exception that the full text of account of "Property Abandoned" is given:

No. 782. Retirement Expense. - An operating-expense account, to be charged with amount of estimated accruing depreciation.

No. 503. Appropriations to Reserves. - A profit and loss account, to be charged with such amounts as may be appropriated from surplus and credited to Account 251, Retirement Reserve.

No. 251. Retirement Reserve.- A balance-sheet account, to be credited with amount charged to Accounts 782 and 503, when the charge to 503 is for depreciation; to be charged with cost of retired property, less salvage, etc.

No. 124. Replacement Fund.- A balance-sheet account. If such fund is created, this account includes assets represented by the retirement reserve.

No. 132. Property Abandoned.- This account is intended as a suspense account, which shall include the retirement loss, i.e., the original cost, estimated if not known, plus cost of dismantling, less salvage on property destroyed or abandoned because of replacement, of obsolescence, of an extraordinary casualty, or for any other reason, when such loss has not been provided for in advance thru a reserve. Amounts thus charged shall be amortized thru annual or more frequent charges over a definitely determined period to such accounts as shall be proper.

These same accounts are required under either the straight-line or the sinking-fund method of depreciation accounting, with the exception of Account No. 124, which is not used with the straight-line method, while it is required under the sinking-fund method, except under the modified sinking-fund method followed by the Wisconsin Commission. This account is optional in the Commissioners' classification and is not required except in cases where it is desired to retain in a special fund, cash or other assets, representing a part or all of the retirement reserve.

As the account, "Property Abandoned," relates to the accounting for losses not anticipated by a provision in retirement reserve, it is of special importance in connection with the treatment of retirement losses. Such an account seeks to equalize the losses that actually occur from year to year. The use of this account is closely connected with two questions, about which centers a stubborn controversy, namely:

1. To what extent should depreciation or retirement losses be anticipated, and provision, therefore, made out of earnings before retirement occurs?
2. If not made out of income before the event, can the losses be charged to future income in whole, in part, or not at all?

These are questions concerning which we shall have to examine the practice followed by the United States Supreme Court, the final authority in such cases as involve alleged confiscation or the taking of property without just compensation, as prohibited under the 14th amendment to the Constitution. It is in cases of this character that questions relative to public-utility depreciation are usually presented to the court.

Retirements Chargeable to Future Operations.- The text of the account, "Property Abandoned," as noted above, provides for amortizing the amounts carried therein by charges "to such accounts as shall be proper." This does not lay down a definite rule that such charges shall or shall not be charged to operating-expense accounts. Disposition is to be made in accordance with the facts and circumstances in each case. It is, however, contemplated that under some circumstances such charges will be made to operating expenses. The charging to operating expenses of the cost of property consumed in operation of prior years may meet objection on the ground that future operations should not be burdened with the cost of property no longer of benefit to operations. It may be contended that such charges should be met from the surplus accumulated from operation of the period during which the retired property was used. This argument fails to consider two points of the practical business problems involved.

In the first place, the rates on which revenues were received presumably were fixed by a commission which allowed only sufficient depreciation charges to operations to retire the property at the expected termination of its usefulness, and not at the time when actually retired by reason of its life being shortened to make way for an improved type or by reason of some other unexpected event. In such case, therefore, past sales have provided no compensation for this loss.

Large surpluses, such as many industrial companies accumulate to take care of unforeseen conditions, are usually not possible of accumulation by a public utility, because under regulation its rates are not likely to be much above the cost of the service, including the cost of capital or return on investment. It is not in the best position, therefore, to stand a charge to surplus for the purpose of writing off a loss which was a legitimate element of operating expense for which it has received no recompense.

The second point for consideration is that the loss in such case frequently is incurred in connection with construction, improvements, or betterments for the benefit of future operations. The old machine could go on functioning until the natural end of its useful life, but the new machine offers to give more efficient service than the old, thus effecting economies in operation and reducing operating cost. The cost of making the change necessary to secure these benefits is therefore a charge to future operations. Such portion of the cost of the old machine as has not been provided for by charges to operation as retirement expense, is as legitimate a part of the cost of making the change as is the direct cost of the new machine, which must be amortized by a charge to the operations of future years.

There is, however, a distinction made between the unamortized portion of the cost of the old and the cost of the new machine. The two items are not consolidated and charged off during the expected life of the new machine, but, instead, the cost of the old unit is charged to the operating expenses "thru annual or more frequent charges over a definitely determined period," as may be determined with reference to the circumstances existing in each case. This appears to be a proper distinction, because the operations following the change are presumed to benefit from the greater efficiency obtained, and in view of the further consideration that conservative management would dictate the writing off, as soon as consistent with financial circumstances, of all costs not represented by the cost of property actually in use or held for use. It is possible that before this new machine is worn out it may be abandoned, to be replaced by a more efficient type. It is desirable, however, to avoid the accumulative effect of such retirements.

A case decided by the Supreme Court of the United States on June 2, 1924, Pacific Gas & Electric Company v. City of San Francisco, has some features that are of interest in this connection.

In valuing the property, certain units that had been rendered obsolete by recent patents were disregarded. The patents were valued at what they cost the company. The controversy related chiefly to the treatment of this obsolete property and the value of the patents. The value of the property before it was rendered obsolete was approximately $800,000. The cost of the patents to the company was $46,000. The actual savings in operation effected by the use of the patents was upward of $4,000,000. The company does not appear to have claimed this value, however, but did claim that the patents should be given consideration in connection with the obsolete property, and that the savings from their use should be devoted, at least partly, to the writing off of the obsolete property. This claim, however, was not allowed by the United States District Court. The U. S. Supreme Court reversed the decision of the District Court and in its decision makes the following statement:

> "The objection to the report most seriously urged is that in his estimate of total value the master failed properly to appraise certain patent rights thru which manufacturing costs had been greatly reduced; also, that he failed to make proper allowances for the successful use of such rights. This objection is well taken. *** Introduction of successful patented inventions enabled the public authorities to lower the rate base and gather all the benefits. The operating plant, made capable of producing gas at smaller cost, was declared less valuable than before. The result indicates error somewhere, either in theory or application of principle.
>
> "Obsolescence of one or more stations and perhaps other property theretofore of great value, (possibly $800,000) followed installation of the patents, but the remaining plant, plus the patents, gave better results. As an operating unit, the new combination had greater value than the old; but the court below disregarded the demonstrated worth of the element which wrought this change ***. After adopting the reduced costs of manufacture for estimating

> net returns, the court gave no proper valuation to the inventions which caused the reduction, and thereby permitted property to be taken without just compensation."

The concluding paragraph of the court's decision is as follows:

> "Whether, under the peculiar circumstances here presented, the rate base should be fixed by adding to the agreed inventory some fair valuation of the patent rights, or whether prompt recoupment should be allowed for the obsolescence caused by their introduction, or whether appellant should be saved from actual ultimate loss by some other feasible method, we will not undertake to determine upon the present record."

The last paragraph in particular is worthy of careful attention. After finding that consideration must be given to the factors for which no allowance was made by the lower court, the Supreme Court does not prescribe the method by which this shall be done, but indicates that it may be accomplished thru one of the following methods:

1. Including in the valuation some fair value of the patent rights.
2. Prompt recoupment for the obsolescence.
3. Some other feasible method.

We need not speculate on what other feasible methods might be considered.

It would appear that one or the other of the specific methods mentioned would offer a reasonable and logical solution. The "prompt recoupment" would undoubtedly be effected by charges against income during a limited period, as is contemplated in the account, "Property Abandoned," of the Commissioners' classification. There are no practical means of obtaining funds from the public for immediate lump-sum payments in such cases, but reasonably prompt recoupment can be had thru spreading the charge in the rates for a limited term. To spread the amount over the whole term of the expected life of the patents would not produce prompt recoupment of the losses, and, as we have already pointed out, it is desirable to eliminate such items as discarded property from the book assets as soon as practicable.

It may also be pointed out that the suggested method of adding an amount to the valuation in recognition of the value of the patents over and above their actual cost might be made to offset the loss on the retired property. Such value, however, might be either more or less than the loss from obsolescence.

Extent to Which Retirement Losses Should Be Anticipated.-

There is a warm controversy centering about the question as to the extent to which retirement losses should be anticipated and provided for in advance of property retirements. The straight-line-depreciation advocates hold that in each accounting period there must be reserved from income an amount sufficient to cover the part of the cost of each piece of equipment that is supposed to have expired during the period, not made good by repairs. They assume that the life of each unit of property can be correctly estimated, or approximately so, and that the salvage obtainable upon retirement can be reasonably determined upon the date of installation.

It is contended that unless the estimated amount for depreciation, based on the estimated life and estimated salvage, is reserved during each year of the life of the property, the investment is impaired; that any shortage in the theoretical amount affects the investment to a corresponding extent. It is further contended that if the company does not obtain the full amount theoretically required in any year, it is estopped from obtaining it in any later period, and suffers permanent loss. Little consideration appears to have been given to the effects of setting up reserves in excess of the estimated requirements.

It is customary for the advocates of the straight-line theory to quote in support of their claims the Knoxville decision of the U. S. Supreme Court. Undoubtedly this decision has an important bearing upon the question, but there are other equally important decisions of the Supreme Court on this subject. A correct understanding of the court's position requires a study of the other decisions, in some of which is found a distinction as to depreciation or retirement losses arising from different causes.

The causes of retirement losses may be included under the following heads:

1. Wear and tear, including deterioration from age and action of the elements.
2. Obsolescence, representing retirement for the purpose of replacing with new or improved types.
3. Inadequacy, representing retirement for the purpose of increasing capacity.
4. Storms and casualties.
5. Public requirements.

It is generally recognized by those familiar with the public-utility business that of the five causes named, wear and tear, or physical deterioration, is the only one the effects of which can be calculated with sufficient accuracy to obtain even a reasonable estimate of the service life of the property units. As to the other four causes, human insight into the future does not permit more than a guess.

For instance, as to obsolescence, equipment when installed usually represents the most approved types then known. As to whether a better type will be invented within one year, twenty years, or not at all, no one can foretell. The development of inadequacy in a property is so dependent upon unknown future conditions of community and industrial development that only the vaguest idea can be obtained at the time of installation as to whether the equipment will ever be discarded because of its inadequacy. Storms and casualties follow no systematic order in their recurrence. As to public requirements necessitating the retirement of property before it is worn out, it would be difficult indeed to estimate at the date of installation of any property the date at which public demands for improvements, in the interest of public convenience, safety, or welfare, might require its retirement.

The advocates of the "retirement loss equalization" method do not deny the existence of depreciation or retirement losses from the various causes enumerated, but they consider impracticable and unnecessary a formula that pretends to give attention to calculations as to the estimated life of hundreds of thousands of pieces of machinery and equipment in a modern public-utility plant. As a matter of fact, no attempt has ever been made upon a large scale actually to apply the straight-line theory except to a limited class of property, such as railroad cars, locomotives, bridges, large buildings, and similar items. The strongest advocates of the straight-line method, and the only advocates among important public-utility groups, are those in control of some of the major telephone properties of the country. Notwithstanding their advocacy of the straight-line theory, they have not as yet applied it in any real sense in their actual accounting. They keep no records of the life of a great majority of the units of the property. Reliance is placed on so-called "averages," but investigation discloses that these "averages" are, in fact, mere guesses, made without any recorded data from which true averages can be obtained.

Decisions of Courts Relating to Depreciation or Retirement Losses.- As to the extent to which depreciation should be anticipated, it is desirable to carefully consider several decisions of the U. S. Supreme Court bearing on this matter. We shall, therefore, review briefly the statements made by the court with reference to depreciation in the more important and oft-quoted cases, referring to them, so far as practicable, in chronological order. In studying the court's expressions, it is well to bear in mind that in some places the court is speaking of depreciation as loss in value or impairment of investment, while in other cases attention is directed especially to so-called depreciation or retirement loss charges against income. We shall later endeavor to point out the necessity of a consistent treatment of these two aspects of the matter, indicating that the relationship between them cannot be ignored.

There may be differences of opinion as to what really constitutes depreciation, in the sense of loss in value, and there may be differences of opinion as to whether the income reservations for depreciation or retirement losses should be made on the straight-line theory or only for the purpose of equalizing retirement losses charged to operation from year to year. But assuming, for instance, that the straight-line or elapsed-life theory is relied upon for our conception of depreciation or loss in value of property, the charges to operation must be made in a manner consistent with this conception of depreciation. In other words, if the investor is forced to accept a reduced valuation as a basis for his return, he must be allowed to recover from earnings such amounts in each year as correspond to the loss computed against him annually in the valuation or rate base. As we shall later touch upon this point, we now pass to a review of some of the court decisions.

In United States v. Kansas-Pacific Railway Company, 999 U. S. 455, the U. S. Supreme Court, in a decision handed down in 1878, said:

> "Only such expenditures as are actually made can with any propriety be claimed as a deduction from earnings."

In view of the later decisions of the court, this expression has no direct bearing on present consideration of the subject, but is of interest as showing that at the date of this decision the Supreme Court did not recognize the propriety of providing in advance for the retirement of property by charges to operation.

The decision of the court in the Knoxville water case, handed down in January, 1909, marks the first definite recognition by the court of depreciation as an element in valuation. It also marks the first recognition by the court of the propriety of making provision out of earnings for the replacement of property before the expenditure is actually made. The following quotations from the same case are pertinent at this point:

> "If, however, a company fails to perform its plain duty and to exact sufficient returns to keep the investment unimpaired, whether this is the result of unwarranted dividends upon overissues of securities, or of omissions to exact a proper price for the output, the fault is its own."

In February, 1909, the creation of reserves for depreciation was approved by the court in Louisiana Railroad Commission v. Cumberland Telephone and Telegraph Co. (313 U. S., 414):

> "That is was right to raise more money to pay for depreciation than was actually disbursed for the particular year there can be no doubt, for a reserve is necessary in any business of this kind, and so it might accumulate, but to raise more than enough money for the purpose and place the balance to the credit of capital upon which to pay dividends cannot be proper treatment."

This case is important, for the reason that it is the first specifically approving the creation of a reserve. This decision is also frequently quoted as authority for disallowing a return on property constructed by the use of moneys reserved for depreciation.

In Lincoln Gas & Electric Light Company v. City of Lincoln, 223 U. S. 349 (decision in 1912), the Supreme Court, speaking of estimated depreciation charges, said:

> "The question as to what sum, if any, upon the facts of this case should be annually deducted from the net income as a permanent maintenance or replacement fund, is novel, and presents a grave problem. So far as can be now seen, reconstruction and replacement charges have been borne by current revenue. If in the past reconstruction and replacement charges have been met out of current expenses, the fact must be taken into consideration, both when we come to estimating future net income and in determining what sum shall be annually set aside to guard against future depreciation *** If the constantly recurring necessity to do reconstruction or replacement work was in 1907 met out of the current income of that year, thereby

> diminishing the net income, the fact should be given weight in estimating future net income: otherwise there will be a double deduction on that account, first by paying such charges as they occur, and thereafter by a contribution out of the remaining income for the same object."

The Court here discusses two methods of providing for replacements:

1. Charging direct to expenses.
2. Creating reserves against which replacements would be charged.

It indicates no preference but points out the danger of duplication by the use of both methods. It is also significant that the discussion refers to deductions from income as constituting a "maintenance" or "replacement" fund to "guard against future depreciation."

In Minnesota Rate cases, 230 U. S. 352, (June, 1913), the U. S. Supreme Court said:

> "The depreciation in question is not that which has been overcome by repairs and replacements, but is the actual existing depreciation in the plant as compared with the new one. It would seem to be inevitable that in many parts of the plant there should be such depreciation, as, for example, in old structures and equipment remaining on hand. And when an estimate of value is made on the basis of reproduction new, the extent of existing depreciation should be shown and deducted."

In Kansas City Southern Railway Company v. United States, in its decision in December, 1913 (231 U. S. 423), the Supreme Court said:

> "The road or the structures have to be replaced with stronger or more efficient instrumentalities. Abandonments occasioned by changes of this character are therefore chargeable to future earnings, for the reason that the improved condition of the road is not only designed to meet the demands of the future, but presumably will result in economies of operation, and so the resulting benefits will be reaped by those who hold the stock of the company in the present and in the future. The railroad company may, if it sees fit, anticipate general depreciations, and make provision for them by establishing a reserve for the purpose; but if no such provision has been made the abandonments should be taken care of by charging them to present

> or future operating expense. In case, however, the amount is so large that its inclusion in a carrier's operating expenses for a single year would unduly burden the operating expense account for that year, the carrier may, if so authorized by the Commission, distribute the cost thruout a series of years."

This case clearly approved the principle that depreciation or retirement losses are not necessarily a charge to earnings prior to the date of retirement; that the losses arising from obsolescence and inadequacy particularly are a charge against future earnings.

Another important decision in which this subject was discussed is New York and Queens Gas Company v. Newton (269 Fed. 227). We quote from the report of Special Master Gilbert, which was confirmed in the U. S. District Court, and the decision of the Master and of the District Court affirmed by the U. S. Supreme Court on March 6, 1922 (258 U. S. 178).

> "In other words, in order to keep abreast of improvements in the art of making and distributing gas when and as it becomes economically advantageous to do so, and to meet the growing demand of the public for service more adequately and economically than would be possible thru merely making additions and extensions to existing plant and equipment, larger or better and more economical and efficient units of plant and equipment are from time to time installed, to take the place of units which are still operating as efficiently as when first installed. The loss due to such supersession cannot properly be said to have accrued during the period the superseded unit was in service. It occurred when supersession took place. It became a proper charge against the economies to be realized therefrom. It furnished no basis for the imposition of an additional charge against the user of the superseded unit during the period of its useful service, over and above the higher cost of operating it. Such a charge could not be justified, either on the ground that the unit was losing potential life, or that the capital invested in it was being consumed, because neither is true."

The foregoing bears particularly on depreciation from obsolescence and inadequacy and squarely holds that prior to the time when supersession takes place there is no loss in value or consumption of capital and, therefore, no justification for charges to operation for depreciation prior to the retirement. This is consistent with the decision in the Kansas City Southern case. The following additional quotation from the New York and Queens Gas Company case is well worth careful attention, because of the definite position taken on theoretical depreciation and, particularly, the consistency of the position as related both to valuation and to charges against income.

> "Even assuming that the statute permitted such a rate, to have imposed on the company's consumers an additional burden nearly twice as great, representing a purely theoretical item of operating cost, merely to accumulate a useless reserve to justify a drastic deduction from investment in some ultimate proceeding as to rates, could not have been justified on any sound theory in the past, and cannot now be sustained as to the future.
>
> *****************
>
> "It is obvious that the collection of an unnecessary reserve and its periodic deduction from the value of the property in service would operate to effect a piecemeal purchase, on the part of the public, of the property used by the utility in its service. In other words, it is really asking the consumer to pay for the plant, instead of paying a return on the investment. If such a consummation is desirable, of which there is no evidence, it should be effected openly, and not surreptitiously, under the guise of providing for so-called 'theoretical depreciation.'
>
> "Present Condition of the Property. - Mr. Miller testified that, as of April, 1920, the expenditure of $6,144.07 for repairs, renewals, and replacements, would put the plant, structures, machinery, and equipment in condition substantially as good as when they were erected or installed.**** This sum, however, does not, in my opinion, measure any impairment in the present value of the property used and useful in the gas business. It represents merely an unmatured obligation to maintain the property in efficient operating condition out of future earnings; the expert witnesses of both the complainant and the defendants agreeing that it was and is maintained in efficient and first-class condition. I therefore have not deducted this or any other sum representing so-called 'accrued depreciation' from the amount found by me to represent the investment of the complainant in its gas property upon which it is entitled to

have its rate such as to yield a reasonable return."

The decision of the U. S. Supreme Court in Galveston Electric Company v. City of Galveston, in April, 1922 (258 U. S. 388, 66 L. ed. 382; Sup. Ct. 351), discussing deferred maintenance of street railway property, said:

> "The company asked to have allowed as a further charge $29,500 a year on account of what is called deferred maintenance. The contention is that during the war and two years following, the company had deferred maintenance, pursuant to a policy established at the express request of the Government, to the end that material and labor might be released for war purposes; that to make good this deferred maintenance would cost $197,000; and that, in order to amortize this amount, an annual allowance from earnings of $29,500 should be made for five years. This is an attempt, in another form, to capitalize alleged past losses; and the request was properly refused, both by the master and the court."

In this case the court appears to regard deferred maintenance as depreciation and to follow the reasoning of the Knoxville decision, that the company must accept the loss as its own fault.

Another decision by the Supreme Court (June 2, 1924) in Pacific Gas & Electric Company v. City of San Francisco, which we quote in part on page 95 holds that the company shall not be required to stand a loss, not previously provided for by reserves, of $800,000, resulting from retirement of property because of obsolescence. In this case the retirement was caused by the installation and use of some new patents. The change of process effected a very substantial saving in operating costs, over $4,000,000, tho the patents which made this possible cost the company only $46,000, and were included in the valuation at this figure. The court held that the company should be allowed to recover the amount of the loss of $800,000 worth of property subsequent to its retirement or be otherwise compensated.

In Cumberland Telephone & Telegraph Company v. City of Louisville, (187 Fed. 653,) decided by U. S. District Court of Western District of Kentucky, Judge Evans said:

> "The master, after finding that the cost of the plant was $1,506,531.21, finds that its present value is only $1,355,878.09. If this is correct, it certainly indicates that in the past enough money has not, from time to time, been expended upon the reconstruction and reinstatement to make good the depreciation and keep the ever-failing parts of the plant up to the standard by resupplying all values that have been destroyed."

It will be observed that the depreciation found by the master was 10 per cent of the cost of plant. The court's conclusion was that sufficient money had not been expended upon replacement "to make good the depreciation" by resupplying all values that have been destroyed." It cannot be presumed that the court was ignorant of the fact that in any plant much of the property is of varying ages and, therefore, the court's view that all values destroyed should have been resupplied by "reconstruction and reinstatement" seems clearly a repudiation of theoretical depreciation. Theoretical depreciation, based on elapsed life, represents large amounts that cannot possibly be put back into the plant without rebuilding it entirely at a given time. The court does not suggest demolishing the plant and building it anew. All values are regarded as put back and depreciation made good by keeping the plant "up to the standard."

In Pioneer Telephone & Telegraph Company v. State, (167 Pac. 195,) September, 1917, the Supreme Court of Oklahoma, sustaining an order of the Oklahoma Commission, said:

> "We have reached the conclusion that in plants of considerable size that have attained their gait, to which class the plant herein is conceded to belong, there is both theoretically and actually a normal condition in which the replacements come along with comparative evenness, and where there can be no possible use for a so-called depreciation fund of any considerable amount.
>
> "In the case at bar, as we have seen, the Commission made no deduction from the value of the plant on account of depreciation, but allowed returns upon its value as a going concern, kept up to a high degree of efficiency by replacements paid for out of current revenue. There is no principle of public regulation more firmly established than the right of the company to charge in its rate an amount which will enable it to make these replacements, and as investors put their money into public utilities for the sake of the returns they will be able to obtain, if the allowance for replacements is sufficient to keep up a high degree of efficiency and prevent a lowering of the ability of the plant to earn returns, we are unable to perceive the necessity for building up a fund to be used for the purpose of conteracting a purely theoretical depreciation. The theory of the Commission seems to be that charges should be made in rates sufficient to counteract or prevent depreciation by replacements, and that when replacements are thus fully provided for, 'depreciation is counteracted.' We see no error in this."

Position of Utility Operators on Treatment of Retirement Losses.- A study of this subject would be most superficial if we did not give careful consideration to the views of those who are carrying the responsibility of financing, managing, and operating the various branches of the public utility business. In noting the opinions of leaders in the industry as to what constitutes adequate maintenance and the proper methods of providing for it, it should be remembered that the viewpoint of the operating official may differ materially from that of the auditor. Likewise, the official in charge of finances, who deals with investors or bankers and brokers handling the company's securities, may have quite another viewpoint. Each of the large groups or classes of utilities, however, thru its national organization, National Electric Light Association, American Gas Association, American Water Works Association, American Electric Railway Association, or American Railway Association, representing the industry, has reached quite general agreement as to principles and methods of accounting for depreciation or retirement loss accounting applicable to the business which each organization represents. In stating the position of the different classes of public utilities on this question we shall be guided by the expressions of those authorized to speak for the respective classes of utilities thru their organizations.

The position of the different utility groups on the treatment of depreciation or retirement losses may be indicated as follows:

1. The electric light and power utilities, thru their organization, National Electric Light Association, are opposed to the "straight=line" method as a basis for determining the charge to operating expenses for retirement losses. They are equally opposed to it as a means of determining loss in value of property. Retirement-loss-equalization method is favored.

2. The gas utilities take the same position as the electric light and power utilities. Some large individual companies in this group favor charging all replacements direct to operation, keeping no reserves.

3. The American Electric Railway Association does not favor the "straight-line" method of computing retirement losses. The retirement-loss-equalization method is indorsed. In dealing with depreciation as related to value or rate base, the procedure followed by the Wisconsin Railroad Commission is approved.

4. The steam railroads are opposed to the "straight-line" method of computing charges to operating expenses for retirement losses. They are equally opposed to this method as a means of determining loss in value of property. Retirement-loss-equalization method is favored.

5. The water utilities do not favor the "straight-line" theory. They approve the use of the sinking-fund method, both in computing the charges to operation for retirement losses and in determining loss in value of property.

6. The telephone companies controlling the major part of the telephone business in the United States advocate the "straight-line" method in determining the charge to operating expenses for retirement losses, but reject it as a method for determining loss in value of property.

In the above summary it will be noted that the telephone companies constitute the only class of public utilities that approves the "straight-line method", for determining depreciation charges but another method for determining loss in value of property. This has been noticeable in several recent rate cases, in which it has been shown that reserves created on the straight-line basis equal between 35 and 40 per cent of the book value of the depreciable property.

In the cases referred to, the engineers of the telephone companies reported that actual deterioration of property, as found by inspection, is less than 10 per cent of book values. In one important case involving telephone property, the appraisal of the property value showing reproduction cost of approximately $150,000,000 was made by using the sinking-fund basis, assuming interest compounded at 4 per cent, for calculating the deduction for depreciation, tho the company had never kept any such fund. The sinking-fund basis, however, was applied only in appraising buildings. The depreciation of other parts of the property was determined by "inspection" made by an engineer of the company. The charge to operations for depreciation was calculated by the straight-line method. Thus, in a single rate case there were presented results under three different methods.

The company claimed that the combination of "sinking-fund" and "inspection" methods should be used in determining how much depreciation existed in the property. By these methods as applied by the company the indicated depreciation amounted to 8½ per cent of book values. The reserve shown by the books accumulated on the "straight-line" method was over 30 per cent.

Such presentations as this greatly tend to confuse the issues, to throw depreciation theories into disrepute, and to raise questions, the discussion and litigation of which is ultimately of advantage neither to the utility nor to the public served.

In discussing on succeeding pages the position of the reulatory commissions, attention has been called to the danger of impairment of investors' rights by a practice the reverse of that outlined above, namely, that of making theoretical depreciation deductions from valuation without the investor allowing annual recoupment on the same basis thru charges to income.

In the one case the utility would collect from the public served under the guise of depreciation charges more than the loss required to be made good, while in the other case it would be required to accept a loss, since it was not permitted to charge to earnings sufficient to equal the loss computed on a theoretical basis in establishing the rate base. Thus the effect of destroying a part of the investment was the result.

The following quotations from authorized representatives of the different classes of utilities will give a fair idea of the prevailing views on the subject of depreciation or retirement losses.

Electric Light and Power Companies. - In discussing this subject before the Interstate Commerce Commission, Hon. Carl D. Jackson, formerly chairman of the Wisconsin Railroad Commission, stated the view of the National Electric Light Association and of the American Gas Association, as follows:

> "There is no waste of assets which will not be taken care of thru ordinary maintenance and an equalizing of retirement losses."
>
> "No such accounting system as proposed (referring to straight-line method) is necessary to insure the integrity of the investment * * *. Impairment of investment could only mean such change in the physical condition of the property as would affect its earnings or organic efficiency or the real market value of its securities."
>
> "The formula laid down here (referring to straight-line method) for our property on a unit basis is a liquidation and amortization formula * * *. It would require us to set up a reserve, leaving salvage aside, amounting to practically 50 per cent of our property, which reserve could never be used for retirement purposes unless we are going out of business, and if we are going out of business we do not want 50 per cent. We want 100 per cent if we can get it. That mathematics is simple, and it is that any reserve built up on this mathematical formula for these classes of property on a life basis can never be used unless all the property is going to become new at one time. This property keeps going out here and there year by year. It does not go out all at one time. In the larger companies it almost equalizes itself thruout the years."

Mr. Jackson quotes, with approval, a statement made by Mr. George C. Mathews, statistician of the Wisconsin Railroad Commission, a man whose experience and judgment qualifies him to speak with authority on this subject, as follows:

> "The classifications (Commissioners' classifications) nowhere refer to any reserve account being intended to cover the difference between the original cost and such conception of value as results from a theoretical dimunution in accordance with age. Unless we are prepared to think of the railroad business as one whose whole life is to terminate and whose activities are to cease, a reserve on any such basis would be

useless. No one contends that the railroads, or any individual road of any magnitude, will ever be entirely restored to a condition where all items of property are new. Such a condition would involve a quite impossible coincidence of retirement dates on all property, or it would mean that property still retaining a great deal of capacity to render service would be retired."

Electric-Railway Companies. - The American Electric Railway Association Committee on Valuation in its 1924 report says:

"In view of the facts that the minor elements of railway property which gradually wear out are renewed thru operating expense without the accumulation of reserves, and that more important elements rarely wear out but abruptly cease to be useful at times which cannot be forseen, or, if foreseen, should not have their retirement provided for in advance, the Committee is of the opinion that computations of and deductions for accrued depreciation based upon inspection of property or its estimated useful life should have no part in valuation proceedings for rate-making purposes.

"The Committee does not hold that no reserves should be accumulated for future retirements of property not normally chargeable to maintenance. On the contrary, it urges that sufficient reserves be accumulated reasonably to provide for anticipated retirements and for contingencies. Such reserves may be substantially less than required to offset the theoretical depreciation above considered. It may not always be wise to limit reserves to these purposes and proportions. Where the commissions having jurisdiction over public-utility property or the courts to which appeals may be taken have a definitely established practice of making deductions for accrued depreciation in determining fair value * * * it is wise to accumulate adequate depreciation reserves as an insurance against loss in such proceedings.

"It is pointed out, however, that such insurance usually involves higher charges to patrons on account of the unnecessarily large reserve which they are called upon to create, and that the protection thereby afforded to the utility at the expense of its customers serves no useful purpose whatever, other than insurance against a practice involving depreciation, which has no logical foundation under the conditions surrounding regulated public utilities. * * *

"The Committee is of the opinion that deductions in valuation for depreciation, even to the extent of existing reserves, really serve no useful purpose, and that the entire question of such deductions may be avoided thru a method adopted by certain commissions which avoid injustice to any interested parties. In its decision in the Duluth Street Railway case (1923 P.U.R. 1923D, 705,736,) the Wisconsin Commission established a rate base without any deduction for accrued depreciation, but held that the income from the reserve should be credited to the reserve, thereby reducing the current provisions for retirements to be collected from patrons. * * *

> "The Committee indorses this procedure adopted by the Wisconsin Commission as a sound and logical solution of the question of accrued depreciation and a means of avoiding further controversies over this problem which has confused many past valuations.
> * * *
>
> "The Committee finds * * * the action of the National Association of Railroad and Utilities Commissioners in recommending uniform classifications of accounts for electric and gas utilities, these classifications being the only national system so far developed by the state commissions, to be in accord with its recommendations in this and previous reports, in that reserves are provided, not for accrued depreciation, but, rather, to equalize the cost of retirements and to make reasonable provision for contingencies. The word 'depreciation' does not anywhere appear in the uniform system of accounts already adopted by more than one-half of the state commissions. * * *
>
> "It is significant that, consistent with the provisions of these uniform accounting systems, certain state commissions have fixed definite limits to the accumulation of retirement reserves, which limits have no apparent relation to theoretical depreciation existing in the properties. There is further significance in the flexibility in retirement appropriations provided for in the electric and gas accounting systems, which recognize that there is no such factor as a uniformly and definitely accruing depreciation, but rather, that retirements which occur without regularity can adequately be provided for by a reserve applicable to the property as a whole. * * *
>
> "The Committee recommends that the Association, thru appropriate committees, undertake to co-operate with the state commissions in eliminating from accounting methods for electric railways any requirement for uniform charges for depreciation based upon estimated useful life of the property, and in substituting therefor the more flexible system of appropriations for retirements prescribed for other utilities."

Steam-Railway Companies.- W. G. Brantley, speaking before the Interstate Commerce Commission in behalf of the steam-railroad companies of the U. S., with reference to depreciation or retirement charges of steam-railroad properties, recently stated:

> "The carriers say it is clearly impossible for them, based upon their past experience, upon their knowledge of these properties, to forecast at all as to how long this bridge will be here, or how long this station building will be here, or how long any of these properties will last. It is an absolute guess. They say it is better for them, it is better for the public, when these retirements actually have to be made, to make them and charge the cost to operation. And they answer your first question as to whether or not a depreciation reserve has any other purpose than to equalize the cost of these retirements from year to year, by saying that they know of no other purpose that it serves or could

> serve, and that depreciation reserve is not necessary, so far as their properties are concerned, in order to equalize operating expenses, because their experience shows that these operating expenses, these costs of retirement, do now in actual experience from year to year fairly equalize themselves, sufficiently so for all practical purposes.
>
> "* * * There may be on this road some great structure, one or more, that if thru some casualty it had to go out in one year it might unduly burden the operating expenses of that year. That might be true on one road, and yet that same piece of property on another road, the other road being so much larger, would not affect the operating expenses of the larger road. But wherever the retirement of any one or two or more very large and expensive properties, considering the road that owns them, would unduly burden operating expenses for the year of the retirement, the carriers think it may be well enough, and they would like the privilege of setting up a depreciation reserve in anticipation of the retirement of such structures. * * *
>
> "You have the suggestion of the carriers that they be allowed to continue to do as they have always done since there has been a railroad--charge the cost of these retirements to operation as the costs are incurred, with the privilege to them of setting up depreciation reserves for certain of their large and more expensive structures as they may feel it good financial policy to do.
>
> "Then you have the suggestion, as I understand it, that comes from our friends of the electric and gas associations, that there be set up a reserve for equalization purposes, to equalize the cost of retirements, but that it not be set up by formula or arbitrary rule, but set up with full knowledge and after full consideration of the facts of the particular property as to the probable amount that from year to year has to be incurred for these retirements. * * *
>
> "It is not substantially different, as I see it, from what the carriers, the railroads, are here asking to do, as I have just outlined it. And what we ask we think would accomplish every purpose that is necessary to be accomplished toward the equalization of operating expenses."

Water-Supply Companies. - The subject of depreciation of waterworks property is discussed in the final report of the Committee on Depreciation of the American Water Works Association, as follows:

> "In life expectancy, the sinking-fund methods should always be applied to determine the amortization rate of important and valuable units, the useful life of which extends over

> a series of years. Such annual payments for renewal are naturally kept in reserve funds and properly invested, so as to earn interest until needed, the interest logically and properly reducing somewhat the annual payment needed for final replacement.
>
> "Straight-line depreciation, on the other hand, is an approximation only, and only has excuse when the life of the unit to which it is applied is short or its value small. * * *
>
> "It should be pointed out here that in all valuation and rate-regulation questions, straight-line depreciation applied to long-lived structures is very unjust to the public, for the reason that the public in the end pays the entire depreciation bill, and if that bill is computed by methods which ignore interest, and thus set aside more annual replacement funds than are really necessary, the public will suffer the difference.
>
> "Provisions for taking care of future depreciation,
>
> "1. Provide for all ordinary, more or less continuous, maintenance as an ordinary operating charge.
>
> "2. Create, where possible, a separate reserve fund for depreciation, sufficient to cover all losses in value other than those covered under ordinary maintenance. Such fund should earn interest, and is subject to withdrawal for replacement when needed from time to time.
>
> "3. Test the adequacy of the reserve fund by careful technical appraisal and review its sufficiency, once, say, every few years, and adjust its annual increment as seems to be necessary."
> (Journal of Am. W. W. Assoc. - March 1919 - pp. 85-133)

Gas Companies. - Speaking before the Interstate Commerce Commission on April 19, 1924, Mr. William L. Ransom, of the New York bar, in behalf of the Consolidated Gas Company of New York, said:

> "I represent here an industry which has existed 100 years in the City of New York -- 40 years as the present company--and in that time we have never made up a life table; we have never charged any consumer with one dollar which was anything except the actual cost of operations, including retirements on the basis of actual expense. We have plants and properties which I think it is admitted are as efficient and up-to-date and economical as any in the world in that industry, yet we have never had a depreciation reserve; have not any

> today, and never burdened our consumers with any such reserve, and never will. We have been in the courts and before the commissions. There is no public utility in the country whose rates and affairs have been more frequently litigated. The companies of this system have been to the Supreme Court of the United States in at least a dozen cases; before state commissions, in state courts and Federal courts, time after time; and there has never been a dollar deducted from the value of the properties of any company of this system in New York City for straight-line depreciation or any other kind of depreciation, unless we except a deduction for a negligible amount of deferred maintenance."

The policy of the Consolidated Gas Company of maintaining no reserves for depreciation or retirement losses shows the opinion of its officers to be somewhat different from the consensus of opinion among the members of the American Gas Association, which we have noted in the argument in their behalf by Mr. Jackson.

In a recent brief filed in the Supreme Court of Illinois on behalf of the Peoples Gas Light and Coke Company (of Chicago) by Mr. George A. Cooke, formerly a member of the Illinois Supreme Court, it is said:

> "The essential hypotnesis on which theoretical depreciation is founded, is that the value of each item diminishes uniformly thruout the years of its useful life. This hypothesis is utterly false.
>
> "Even tho the separate units may have a limited term of usefulness, it is not true that the life of the whole plant is thus limited. It is intended for continued service under the perpetual charter of the company, and it is constantly renewing its life, overcoming the effects of time, wear and tear, obsolescence, and inadequacy, and thereby maintaining its usefulness and value impaired.
>
> "Under adequate rates, the cost of repairs, renewals, and replacements is met out of revenues; in a plant of this character, the regularity of such demands makes it unnecessary to accumulate any considerable fund for such purposes.
>
> "With the property adequately maintained and a full return upon its value allowed, no fund is needed to protect the investor against theoretical depreciation. If none is needed, none should be provided. If none is provided, there should be no corresponding deduction from value."

Treatment of Retirement Losses by Regulatory Commissions.-

The subject of depreciation for retirement losses of telephone companies, railroads, gas, and electric utilities has been discussed recently at great length before the Interstate Commerce Commission. These discussions were in connection with a study being made by the Commission with a view to determining the action to be taken by it under Section 20, Paragraph 5, of the Interstate Commerce Act. By this section the Act was amended in 1920 so as to authorize the Interstate Commerce Commission to prescribe the percentages of depreciation which common carriers subject to the Act, which includes telephone companies, shall charge to operating expenses.

Altho the electric and gas utilities are not subject to the jurisdiction of the Interstate Commerce Commission, they participated in the discussion. Their reasons for so doing were that as large shippers of coal and other commodities they were vitally interested in the subject of depreciation charges, because of its bearing on railroad freight rates. Another reason given for their participation was that if any improper or unsound methods should be established by the Interstate Commerce Commission, the tendency would be to extend such methods to other public-utility industries.

The Commission has completed taking testimony and hearing argument relative to depreciation charges of telephone companies and steam railroads (I.C.C. Docket Nos. 14700 and 15100), but has not yet announced its decision as to the basis on which depreciation charges shall be computed.

The depreciation section of the Commission in a report to the Commission has recommended the adoption of the "straight-line" method. It disapproves of the use of the "sinking-fund" method. Altho advocating the "straight-line" method, the report of the depreciation section with reference to depreciation charges of telephone companies presents a formula the effect of which would appear to be to equalize retirement losses from year to year rather than to provide a reserve on the straight-line theory.

This report abandons the idea of separate accounting for each unit and uses instead the average of total requirements for each class of property. With reference to railroad property, the report concedes the impracticability of applying either straight-line or sinking-fund depreciation accounting to a very substantial part of railroad property.

In announcing hearings on this subject, the Interstate Commerce Commission requested that there be a discussion of the question, "Has a depreciation reserve any other purpose than to provide a means of equalizing the effect of property retirement so that the disproportionate burden may not fall upon the operations of any one year? If so, what other purpose or purposes has it?" The fact that the Commission invited discussion on this question would seem to indicate that it is not definitely committed to any method. If the Commission were satisfied that the advocates of the straight-line method are correct in their assumption that the Knoxville decision of the Supreme Court settled the law on this question and that it requires the use of the straight-line method, a discussion of the question proposed by the Commission would be futile.

Very great interest attaches to the action of the Commission in this matter, not only because of its deep significance alike to the carriers and to the public, but also in view of the commission's previous adherence to the straight-line method in determining loss in value in connection with the valuation of railroad property. It is difficult to see how the Commission can apply the straight-line theory in valuation cases and at the same time apply to the determination of depreciation charges to operation any method producing substantially different results.

If the valuation on which the investor is to be allowed a return is reduced to an extent proportionate to the aggregate of the estimated expired life of each piece of equipment, and if there is not allowed by the Commission in its rate decisions, revenues sufficient to cover depreciation charges to operation on the same basis so that for a given year the cash reserved for depreciation shall equal the amount that would be deducted by the Commission for loss in property value during the same year, confiscation of property and impairment of investment will follow.

The result of applying one method in valuation and another in computing depreciation charges to operation may be shown by the following illustration:

The Interstate Commerce Commission is now making its first valuation of the railroads of the United States. We will assume that the valuation placed on one of these railroads at the present time is $500,000,000, and that in arriving at this "fair value" it has deducted depreciation on the straight-line basis. The Interstate Commerce Commission also fixes the rates to be charged by railroad companies, and in computing the revenues required by this railroad the Commission allows $10,000,000 per year for depreciation, to be included in operating expense. The depreciation of the property, however, on the straight-line basis would be $20,000,000 per year. The Commission must keep the valuation of railroad property up to date, and in determining valuation five years later, assuming that it applies the straight-line method of depreciation as it did in the first valuation, and assuming that the same amount and kind of property is in service, the depreciation or loss in value for five years would be $100,000,000. The company, having been allowed $10,000,000 per year, or only $50,000,000 for the five years, would therefore have suffered a deduction of $50,000,000 for the five years more than it had been allowed to collect for the purpose of preserving the property in a serviceable condition and keeping its value unimpaired.

The above illustration will serve to show why the basis used in valuation must be consistently applied as to future charges to income. The railroads have quite generally charged replacements of much of their property to operating expense as the replacements became necessary. Ties and rails are conspicuous examples of replacements so made. The Commission now finds, of course, that the ties in service are of varying ages, approximately 50 per cent of the life on the average having expired.

There is no reserve to cover this theoretical loss of half the value of ties. The question is, Shall the investment in ties be correspondingly depreciated?

A significant statement in a recent brief of counsel for the Commission is as follows:

> "That in a mature road there is a constant 50 per cent tie condition means merely that only a 50 per cent reserve need be set up * * *. But to avoid inequity in recognizing 50 per cent tie condition a depreciation account is provided in the uniform system of accounts whereby the carrier can recoup from the public, if it chooses to do so, the 50 per cent deducted."

The carrier must not only "choose" to recoup the necessary amount, but it must, under regulation of rates, be allowed to do so by the Interstate Commerce Commission. It would seem to be the inference from this argument that the fact that a carrier has not chosen or been allowed to set up a 50 per cent reserve in the past, the deduction must be made in the valuation on the ground that under the Knoxville decision it was the carrier's own fault that it failed to provide such reserve.

It will be interesting to note the attitude taken on this question when it comes to the Supreme Court, having in mind the opinion of the court in the Kansas City Southern Railway case and the recent decision in the Pacific Gas and Electric case, both of which we have heretofore quoted in part.

On this point some pertinent observations are made by Commissioner Eastman, of the Interstate Commerce Commission, in his dissenting opinion filed in connection with the finding of the majority of the commissioners in Valuation Docket No. 25, concerning the valuation of the San Pedro, Los Angeles & Salt

Lake R. R. Co. (June 7, 1923). The Commissioner said:

> "In my judgment. depreciation should be deducted from 'value for rate-making purposes,' where a property has been well maintained to the extent that it is necessary in successful operation to create a reserve fund for protection against depreciation. Viewed in this light, I am led to the conclusion that the deduction which the majority have made for depreciation in estimating cost of reproduction less depreciation may be too large. If, for example, ties have been properly maintained, a deduction of 50 per cent for depreciation impresses me as theoretical rather than real.
>
> "If earnings in the past have been insufficient to enable the company to make proper provision against depreciation, this fact, it seems to me, may well be considered, as in the case of losses during the development period, in determining the 'fair return' necessary to attract further investment of capital".

In the proceedings before the Interstate Commerce Commission referred to above, in connection with depreciation charges of telephone companies and steam railroads, the National Association of Railroad and Utilities Commissioners presented, thru the Chairman of the Association's Committee on Depreciation, Mr. Thorne A. Browne, a statement of its views. The following is a part of the statement on behalf of this Association:

> "As a special committee, we said we indorsed the equalization or retirement basis when applied to such companies as telephone companies now are, who have been in existence a considerable time, and have reasonable reserves. * * *
>
> "Now, it has been said that you must protect your property. I just want to show you for a moment what will happen. Let us take this assumption: You have got two companies of the same size, the same physical characteristics, the same revenue, the same expenditures, the same rate of paying dividends. One of them follows the method set forth here by the telephone companies; the other follows the method set forth here by the steam-railroad companies, as a matter of accounting. They have identically the same expenditures, under my proposal. I don't care whether it is five years or fifteen years or twenty years, one cycle or two cycles, they will each of them have the same property at the end of the period. It will never disappear. They will spend all that is

necessary to keep the thing going in either instance, but one of them will have earned enough to pass over to the depreciation reserve what they call expense. The other denies that it is expense and will have passed it over to the free surplus, and both of them, we will say, will have invested that money in additional plant and not capitalized it. In the course of time, under the same identical rates, expenditures, life, and with free surplus undisturbed, one will have in the reserve for depreciation but invested in additional plant, approximately 50 per cent of the total cost of the property. The other will have it over here in the surplus, but there will be no difference whatever in the property. There will be no diminution of service, no diminution of efficiency, no possibility of the plants disappearing. It is all an accounting matter.

"I favor the steam railroads' proposition for one thing if not for anything else, and that is that it is consistent. They say the same thing regardless of what kind of a case they have up. It has been said here by one respondent that we must keep this separate from valuation. Gentlemen, accounts are records of fact, and if the accounts say there is a certain depreciation, that ought to be the fact, ought it not? You cannot separate the two things. But, we do have this sort of a situation, repeated and repeated again, that a public utility will say,'We have used up our property at a certain rate. Let me illustrate by what has been said to me by the Illinois Commerce Commission; there had accrued under this formula, 30 per cent. Now, it is said here that that is a part of the property used up. That means it is gone, does it not? It is not there in value. The 30 per cent, of course they have set that aside and invested it over here in additions and betterments, so that the property is all here. It is a very conservative method, but when they went into the valuation case, they said 'That is not true. We have got 92 per cent of our property left.' Now, I insist that they must be wrong one time or other; that if their property is in 90 per cent condition and they have got 30 per cent in depreciation reserve, 20 per cent of that is misnamed, and it is 'surplus.' I have no objection to surpluses, but if they have 30 per cent in reserve, it does represent loss of property, and they cannot claim that it is in 90 per cent condition at another time."

The matter of depreciation or retirement loss in connection with electric, gas, and water utilities is under the jurisdiction of the various state regulatory commissions. The National Association of Railroad and Utilities Commissioners, to which reference has been made, is a voluntary organization of the various state commissions. Its recommendations and findings are advisory in character and not controlling as to the matters committed to the individual commissions by the laws of the several states. For the purpose of ascertaining the position taken by the commissions in various states it is, therefore, necessary to examine the decisions of such commissions.

The subject of depreciation and retirement losses is usually dealt with in cases coming before the commissions involving the rates for service of individual companies. In such cases the commission must determine what amount or percentage constitutes a proper charge for depreciation to be included in operating expenses and what amount, if any, must be deducted for depreciation in determining the value of property. We cannot, therefore, quote at length from such.

The following extracts from recent decisions will indicate the trend of thought and practice on this subject as revealed in the decisions of certain commissions and courts:

The Michigan Public Utilities Commission, in a decision dated March 1, 1924, relative to rates of the Monroe Gas Light & Fuel Company, said:

> "It is not denied by this utility, however, that its retirals up to the present time have not equaled the amount of reserve set aside; and it is not claimed that the company now has in mind any large program of immediate future retirals. We do not believe that the ratepayers should

> be charged with excessive amounts for that purpose. As a matter of fact, the amounts for retirements of property should, as nearly as possible, merely equal from year to year the actual retirals that become necessary * * *. We think on the whole, however, that upon the showing made, allowance for retirals should not at the present time exceed 7 cents per M cubic feet of gas sold, and we so find."

The Maryland Public Service Commission in a recent decision relative to the rates of consolidated Gas & Electric Light & Power Company of Baltimore (opinion 7609) said:

> "With neither the method nor the rate employed by the company in its depreciation calculations will we now interfere, but it is our view that when the accumulated depreciation reserves shall amount to 10 per cent of the fair value of the property, future accretions shall be made only to the extent of the net retirements.

The Oregon Public Service Commission in a decision relative to rates of the Idaho Power Company (February 1, 1924, Order No. 1045), said:

> "Where many replacements are made thru the maintenance accounts, it becomes well-nigh impossible to estimate the proper allowance to be made for the retirements charged as such. There apparently is no exact line of definition between maintenance and retirement. Both may be deferred beyond the period wherein they should be charged to the ratepayer. A provision for both as an upkeep allowance based upon the actual experience and history of a series of years removes the foregoing objections and is, therefore, to be much preferred for regulatory purposes.
>
> "We find * * *
>
> "That a reasonable and proper allowance for upkeep for both maintenance and retirement expense for the year 1922 is $389,000; and that, unless otherwise ordered by the Commission, for 1923 and for each succeeding year thereafter the allowance for upkeep should be $380,000 plus an amount derived by applying to the net additions

> since Dec. 31, 1922, in any fixed-capital account, the actual annual upkeep percentage (ratio of the sum of actual maintenance cost and actual realized retirement cost to average amount of depreciable fixed capital of the same kind) for the five calendar years next preceding.
>
> "That the remainder of the upkeep allowance * * * after deducting all operating maintenance charges therefrom should be charged to operating expenses as a depreciation (or retirement) expense and concurrently credited to the depreciation reserve."

The Indiana Public Service Commission in a recent decision relative to telephone rates of the Indiana Bell Telephone Company (Case 6764) fixed a depreciation rate at 4 per cent of the book cost of the entire plant. The commission stated that this would provide for all retirements and leave an ample sum for extraordinary contingencies and unrealized depreciation. With reference to the amount that would be provided in excess of retirements it said:

> "This excess should be permitted to accumulate until such time when the depreciation reserve (including the balance now in such fund) has reached a sum equal to 10 per cent of the book cost of the property."

The Pennsylvania Public Service Commission in a dealing with rates of Johnstown Water Company (P.U.R. 1922D, p. 35), said:

> "Considering that respondent's property has been and is being well maintained, the commission will allow $30,000 annually as a reserve for depreciation, which sum is approximately three-fourths of 1 per cent on so much of respondent's property as is depreciable.

The commission has not stated the processes by which it arrives at this amount, but the language used and the percentage mentioned, which, according to the straight-line method, would mean an estimated life of approximately 133 years, makes it clear that the commission did not use a theoretical basis.

The Wisconsin Railroad Commission in dealing with the subject of depreciation has given recognition and very careful consideration to the relationship between loss in value, in valuations for rate-making purposes, and the depreciation charge against income. The following quotations from the commission's orders in cases involving the rates of the Duluth Street Railway and the Wisconsin Telephone Company give a good idea of the reasoning of the commission.

In the Duluth Street Railway case, (P.U.R. 1923D, 736,) the commission says:

> "A second method of giving consideration to accrued depreciation, altho the effect of such depreciation is not measured by a deduction from the rate base, is to compute the rate of return upon the rate base before giving effect to accrued depreciation, which means that the utility is permitted to earn a return upon all property, including that built from reinvested reserves, and to provide for a credit of interest to the reserve based upon the reserve balance * * * The result of providing for the credit or payment of interest to the reserve means that to the extent that such interest increases the reserve the necessary charge to operating expenses is diminished, and consequently, while the return to be provided, in total, is greater than where the effect of accrued depreciation is considered directly in the rate base, the cost to the customer is not greater, because the amount of operating expenses which he has to meet is diminished to the extent that interest added to the reserve makes it necessary to charge operating expenses in order to provide the reserve. Therefore, if the provision for depreciation is made upon a proper basis there is no necessity for giving effect to accrued depreciation directly, in determining the rate base, altho to determine value as distinct from the rate base such procedure would probably be required."

The following quotations from the order of the Wisconsin Commission in an order dated February 26, 1925, relative to rates of Wisconsin Telegraph Company, explain somewhat more fully the commission's view of the correct procedure, (a) in cases where the reserve is of the same amount as the actual depreciation, and (b) in cases where the reserve is in excess of actual depreciation.

> (a) "To the extent that reserve represents a real decline in value the rate base should be reduced. This reduction can be accomplished either by direct deduction from the undepreciated whole, or, not making such direct subtraction, by applying the earnings permitted on that amount or a fair part of them, for the benefit of the customers whose payments credited to the reserve have protected the telephone company against depreciation losses. * * *
>
> "The sinking-fund method, by applying for the benefit of customers' earnings on amounts which might be deducted directly from capital, accomplishes such reduction in effect.
>
> (b) "To the extent that the reserve may be in excess of actual depreciation, it can only represent advance provision of capital to meet a loss to occur later, and fairness to those who have made that advance provision requires that they be given a benefit from the use of such capital. The sinking-fund method is the practicable way of extending such benefit."

The provisions of the classifications of accounts, approved by the National Association of Railway and Utilities Commissioners and adopted in many of the states, contain the following language with reference to so-called depreciation charges, designated in the classifications as "retirement expense:"

> Purpose: "Equalize from year to year, as nearly as is practicable, the losses incident to important retirements * * *. It is the intent * * * that a reserve shall be provided * * * sufficient to cover all retirement losses that may reasonably be expected. * * * The excess over the balance contained in the reserve should be charged to Account 132, 'Property Abandoned,' or other appropriate account, * * * when such loss has not been provided for in advance through a reserve."
>
> "Basis of charge should be upon a basis determined to be equitable according to the accounting company's experience and best sources of information, and should in all cases be sufficient to provide during a period of years a reserve against which can be written off all losses sustained upon the retirement of property for any cause whatsoever."

The foregoing quotations contain no reference to any specific method of computing the charge to operation for retirement losses. It is clearly the intent to provide out of income for all losses that occur. It is just as clearly the purpose to provide for such losses in advance of retirement so far as they may "reasonably be expected."

There is a frank recognition of the impracticability of providing in advance for all losses. Those which can be anticipated by the exercise of reasonable judgment and foresight are to be provided for. The account "Property Abandoned" is to be used as a medium for charging off losses which have not been provided for thru a reserve. The provisions of the classifications, therefore, are intended to assure complete provision for retirement losses, but instead of building up useless reserves on some theory impossible of practical application, the reserves are to be based upon each company's experience and best sources of information. The classifications of accounts do not attempt to lay down any rule that would be applicable to all utilities, but plainly recognizes the fact that the experience and circumstances of each particular property must be considered in determining the retirement-expense charge for that property.

Combination of Maintenance and Retirement Expense. - A method frequently employed by regulatory commissions when obliged to determine the amount of income that must be provided for the upkeep of property is to ascertain from the records the amount required to meet both current maintenance and retirement losses during past years, determine its ratio to the property in service, and make allowance for future expense accordingly. The percentage allowed for the future period are not necessarily the same percentages that have been found necessary in the past, as consideration must be given to any changes in the types of property or the conditions of its use which are likely to affect its period of usefulness and, therefore, the amount of retirement loss to be provided for annually. Consideration must also be given to any extraordinary quantity of fixed capital recently added on which comparatively little maintenance has been required.

The purpose of this method of procedure is to avoid the evils that might come from incorrect estimates as to the depreciation or retirement losses. It is recognized that under any accounting rules that may be prescribed there is likely to ensue some differences in the interpretation and method of application in the accounts by the accounting organizations of different companies. The dividing line between units of property for which reserves are provided and the units charged direct to operating expenses is not always clearly drawn.

Numerous cases have come to the writer's attention in which provision was made in the reserve for writing off the cost of certain classes of property, but when the time came for replacement the charges therefor were made direct to operating expenses and the reserve applicable to such parts remained unused. Where the reserve is set up on the "straight-line" or "sinking-fund" method it is particularly important that strict observance be made of the rule that the reserve shall be used for charging off all items for which depreciation charges have been made, and no other items.

The practice of commissions in combining the current maintenance and retirement expense accounts in rate cases does not prevent companies from keeping on their books separate accounts for "maintenance" and "retirement" expense. The combination of the maintenance and repairs charged direct to expense and the retirements charged against the reserve is simply for the purpose of obtaining more exact results and avoiding as much as possible the serious consequences that might arise from irregularities in the accounting procedure.

An illustration of this method of dealing with maintenance and retirement expense in rate cases is found in the decision of the Illinois Commerce Commission, rendered August 16, 1923, prescribing rates for the Illinois Bell Telephone Company in the City of Chicago. The commission said:

> "We find, and the records show, that the company does not possess the information that would permit this commission to make a finding as to the proper annual requirement to cover depreciation when it is considered separate from maintenance. We do have excellent ground upon which to forecast what the combined maintenance and retirement requirements will be. * * *
>
> "The commission will depart from the method employed by the company and will in its findings provide a combined maintenance and replacement allowance which is adequate and sufficient in the judgment of the commission to fully protect the investment in this property and permit the company to accrue a reserve in the anticipation of property retirements. The commission does not deem is advisable to restrict the allowance to that which experience has shown is barely necessary, for such action might result in unnecessary economies on the part of the company with a corresponding decrease in the quality of the service to the consumer." * * *

In a brief filed in the U. S. District Court involving the same question, the commission said:

> "The order of the commission, if made effective, does not interfere with a proper keeping of depreciation accounts. It simply provides an amount for maintenance or upkeep of the property which is adequate to cover both maintenance and depreciation with a reasonable margin of safety. The division between these two accounts is a matter of bookkeeping. The important question here is not how maintenance accounts should be divided as between current maintenance and depreciation, but is a question as to what amount of money meets the Company's requirements for such expenses."

Business Consideration Affecting the Provision Made for Depreciation. - A perusal of many discussions on depreciation, particularly matters presented before commissions and courts, discloses that the engineering, legal, and accounting phases have been given much attention, but that some of its broader aspects in the nature of financial, economic, and business consideration have often received scant attention. The engineer dealing with the subject frequently follows an analytical process. He inventories the property piece by piece, considers its cost or value new, as a separate piece of material, machinery, or unit of the plant, and by further considering its probable life, its age, present condition, serviceability, probable scrap value, and other factors, he arrives at an opinion of the present value of the separate parts or classes of units. These values are then summed up to give his conception of present value, or value new less depreciation, of the entire property. Not uncommonly such appraisals fail to take into consideration the accounting methods employed by the company in connection with replacements, whether they have in the past been charged direct to operation, the amount and the use made of reserves, the basis on which accumulated, and other related matters.

The experienced judgment of the engineer and his analytical methods are most helpful, in fact indispensable, but when we approach the question, "What constitutes depreciation in the sense of loss of investment value?" we deal with a question that cannot be answered alone out of the engineer's knowledge and skill, nor will accounting analyses or legal opinions suffice.

In connection with the consideration of loss of investment values as a result of what is called "depreciation," it seems pertinent to observe some of the characteristics of the public-utility business and the conditions under which property is employed with reference to -

1. Its permanency.
2. Its unity.
3. The extent to which a reserve on a theoretical elapsed life basis can actually be used while the enterprise is a going concern.
4. Whether a reserve would actually protect the investment if the enterprise ceased.
5. The investor's relation to the depreciation question, particularly as regards the use of depreciation reserves in lieu of new capital.

Permanency of Public-Utility Industry. - Altho the public-utility industries are relatively new as measured by standards of recorded history, they are to-day property regarded as permanent institutions - as permanent as the communities which they serve. Without them the complex social and commercial life of modern civilization, with our great cities and widely extended national interests, could not have developed. Nor could it continue to exist without the vast facilities for transportation and communication between different places, or without the instruments of local public-utility service furnishing water, light, heat, and power, with their accompanying time and labor saving inventions.

When a company accepts a franchise to render one of these public-utility services it obligates itself to construct and maintain a plant for continuous, permanent use. Notwithstanding the fact that some municipal grants of authority for the use of streets may run only for a limited period, no public utility constructs a plant with any expectation that its life and usefulness are so limited. If such were anticipated, plants would never be built except upon absolute assurance that the whole investment could be amortized during the limited period. Such amortization would mean that the public served would pay the entire cost of the property. The consumers do not usually want to buy the property. For them to do so would mean a gratuitous investment on their part in order that succeeding generations of consumers might be relieved of part of the cost of service.

The property of a public utility must, therefore, be regarded as a permanent property, not as one in which the investment must be amortized and the business liquidated. The question of depreciation of such property is, therefore, a question of continuing it indefinitely as a going concern; in other words, paying the cost of retiring and replacing parts of the plant just so fast and no faster than demanded by considerations of highly efficient but economical operation.

Unity of the Public-Utility Enterprise. - Those members of the community who as investors put their money into a public-utility enterprise thru purchase of stocks and bonds, view it as one enterprise, one property, one instrument of service. The component elements of brick, pipes, wire, poles, and machinery have little significance to the investor. It is the property as a whole that renders service, that produces income, that is a thing of value; it is that property which must be valued for rate-making purposes as a living, going concern; it is that property that must be maintained as a useful instrument of service. It is neither desirable nor possible to keep each of the tens of thousands of component parts of the property in a state of perpetual newness. In the normal operating condition the parts are of varying ages.

When each part of the equipment becomes worn out so that it does not do its work efficiently, it is replaced with a new piece. Such replacements go on daily, monthly, and yearly, and the plant goes on operating as efficiently and is as capable of producing its output as the day it began. Does this condition of itself render the bonds of the company less secure or reduce their value on the market? The answer of the investor recorded in the security markets is "no."

The larger electric light and power properties probably could not be built in less than five years' time. By the time the property is ready to operate a definite and ascertainable part of its value is gone, if we accept the straight-line theory, altho its advocates, in practice, do not recognize any depreciation prior to the beginning of operations.

Shall we accept their theory and say that the investment is impaired at the moment that operations begin? or shall we accept their practice, which seems to assume that the property investment is intact when operations begin?

If we take the latter view as correct, shall we then accept the doctrine that from the moment of its first use the plant decreases in value in proportion to the increase in the elapsed life in the multitudinous parts of the plant? Again, the investor answers, "no," by offering more for the bonds after a few years' operation has seasoned them.

What is desired is a serviceable and efficient property that will function as good or better than a new property. Machinery that has been in use for a period may well function better than immediately after its installation. The investor wants dividends and the assurance of their continuance, which means safety of investment. He wants to know that the property is maintained in good condition out of earnings, so that he will not be called upon for additional capital to maintain the property and preserve its earning power. This is the test that he applies. He cares little whether that end is attained by estimating some of the expense in advance or by simply paying it when it falls due.

Since the theory of straight-line depreciation rests on the assumption that the investor will suffer loss if this theory be not applied, it seems entirely pertinent to inquire as to his position and to see whether he regards his investment jeopardized when the more customary methods of providing for maintenance are followed. We have already noted his expressions of opinion as reflected in market quotations of securities. Another form in which the investor may be said to have recorded an expression as to the bearing of depreciation accounting upon investment values is found in the mortgages constituting the contract between the bondholder and the utility corporation, setting forth the terms under which he places his money at the disposal of the corporation. Many of these mortgages contain a provision that the company shall expend a certain percentage of its gross revenues annually for "maintenance," or, if not all expended during the year, the balance shall be held in reserve for use in subsequent years.

It is sometimes provided that the accumulated reserve, when not needed for replacements, may be invested in additions to property. The writer has examined many such mortgages and has never found one in which any reference was made to estimated life of property or anything remotely suggesting the use of the straight-line theory of depreciation. The percentages are usually based on earnings, thus clearly indicating that the investor's idea of security of investment centers in the preservation of earning power of the property as an operating unit.

We have noted the fact that the Consolidated Gas Company of New York City has never had a reserve for depreciation, that its plants have operated one hundred years, and are now claimed to be among the most efficient gas plants in the world; that no depreciation has ever been deducted from valuation in the various rate cases before the courts. This company's securities are now held in high esteem by investors, indicating no fear on their part of any impairment of investment.

It is interesting to note that current quotations on the New York Stock Exchange of the common stock of this company show it selling at a price to yield slightly less to the stockholder than the common stock of the American Telephone & Telegraph Company, which company has probably the largest depreciation reserves of any public utility in the United States. The American Telephone & Telegraph Company has much larger assets than the Consolidated Gas Company and its business has the advantage of not being dependent upon a single community or section of the country, and yet we find investors preferring to buy Gas Company's stock at a price that yields somewhat less than the Telephone stock. Whether the purchasers, in making the difference in price, thus indicating a willingness to accept a lower yield on the gas stock, do so because of its supposed greater safety, we cannot say, but certainly they do not appear to have any alarm about the absence of a reserve on the books of the Gas Company. They cannot be ignorant of the facts, as the balance sheets are frequently published. Many instances of this kind could be cited, showing that investors give their principal attention to matters other than depreciation theories.

Reserves Based on Elapsed-Life Theory Not Needed. - A public utility cannot use, so long as it is a going concern, all of a reserve based on the straight-line theory. As already pointed out, the reserves on this theory reach and remain at a point approximately 50 per cent of the plant cost, the amount fluctuating around this figure. This is because, on an average, half of the life of individual parts has expired - some parts being new, some old, others at various intermediate stages of elapsed life. But to take them out before their full service has been given means useless waste. It is, therefore, utterly impossible to ever use the major part of a reserve on the straight-line theory. The most that can ever be used will be such amount as needed to meet the greatest demand at any one time.

For instance, if a $100,000,000 property should normally have a reserve of $50,000,000 (50 per cent), and in some year it becomes necessary to retire $10,000,000 worth of property, the reserve would be reduced to $40,000,000, not considering the normal additions to the reserve for the year. Such a large proportion of the plant would rarely be retired during a single year, but assuming that this marks the greatest demand to be made at one time, the balance of $40,000,000 will remain permanently unused for depreciation purposes so long as the business endures. If the investment increases from year to year the amount of unused reserves will increase in approximately the same proportion.

Investment Not Made Secure by Reserves on Elapsed-Life Theory. - From the standpoint of depreciation, a business that is liable to cease within a limited period is one thing, while a business of practically perpetual existence represents a different situation. The advocates of the "straight-line" method of accruing depreciation, as we have noted, claim that setting up reserves based on estimates of probable life is necessary to prevent impairment of the investment. An examination, however, of the subject will show that the strictest application of the straight-line theory cannot possibly guarantee the return to public-utility investors of their original capital in the event that the business should terminate. This may be indicated by the following illustration, based upon certain facts disclosed in a recent case before a regulatory commission.

It was shown that the plant is carried on the books at original cost of approximately $100,000,000. Of this amount, $30,000,000 was paid for by the use of all moneys belonging to depreciation reserve, the original investment of the owners having been $70,000,000. The company's engineer estimates that the salvage value of the entire plant does not exceed 10 per cent of $10,000,000. The first column shows how much the investor could recover upon liquidation of the business if the reserves were held in cash or other form of investment, as is the case under the "sinking-fund" method. The second column shows the results as they would appear in cases where the depreciation reserve is invested in the company's own property, which would be scrapped along with the rest of the plant in the event of liquidation of the business.

	Dep. Res. in cash A	Dep. Res. invested in property B
Original cost of total property, Dep. Res. ($30,000,000) A. held in cash; B. reinvested in additional property.	$70,000,000	$100,000,000 30,000,000
Original investment by owners	$70,000,000	$70,000,000
Salvage estimated at 10%	7,000,000	(Orig. Prop.) 7,000,000 (added Prop.) 3,000,000
Cash in depreciation fund	30,000,000	none
Total amount realized by investors after dismantling and disposing of property,	$37,000,000	$10,000,000
Amount of original investment not recovered,	$33,000,000	$60,000,000

As depreciation reserves are usually invested in the company's own property, the results of setting up reserves on the "straight-line" theory, as applied by its principal advocates, are well indicated by this illustration, showing that under the circumstances stated the investor could recover $10,000,000 out of his $70,000,000 original investment. It is, therefore, apparent that the faith of those who rely upon the "straight-line" method as a protection against the impairment of investment rests upon extremely meager foundations when there is any prospect of the business being discontinued.

In the foregoing, we have considered the developments under the "straight-line" method on the assumption that the enterprise might be liquidated. It is under such conditions that the "straight-line" method would be required, if ever required, to protect the investment of public utilities. The protection afforded under this method is not substantially greater than under the other methods of providing for retirement losses which we have discussed. As has already been noted, if the public-utility business is to be considered as a permanent industry, there will be no need for the large reserves resulting from the application of the "straight-line" method, and, on the contrary, if the business is to be considered one to be liquidated, the usual application of the "straight-line" method does not protect the investment.

Status of Depreciation Reserves Invested in Plant. - As previously discussed, commissions and courts have quite frequently used the depreciation reserve as the measure of the depreciation to be deducted from plant accounts (or appraised cost new) in cases where the depreciation moneys have been expended for additional property (not replacements) included in the fixed-capital accounts. The Supreme Court has dealt with this situation in certain cases wherein it appears to have approved such deductions. However, there is still considerable argument as to whether the courts' decisions should be construed as laying down a rule applicable to all cases where reserves are so invested. We have noted two decisions within the past year (one by the U. S. District Court, Southern District of New York, and the other by the U. S. District Court, District of Maryland) in which one court approves and the other disapproves of such deductions. Evidently, both consider that they are acting in accordance with the rulings of the U. S. Supreme Court. The point to which attention is here directed is, that if the deduction of the full depreciation reserve is to be made it would be unwise for a utility company to create excessive depreciation reserves and reinvest them in its own property (on which no return would be allowed) when it could obtain and use new capital on which the usual rate of return would be allowed to the company.

Summary of Discussion. - In seeking light upon the nature, extent, and treatment of that element of operating expense known as "depreciation" or "retirement" expense, we have examined the opinions, arguments, and conclusions of those in position to view the matter from points of view reflecting the legal, economic, engineering, business administration, and public-policy aspects of the subject. The conclusions which we have noted are drawn from three general sources or groups, each of which stands in a different relation to public-utility problems, as follows:

1. Those within the industry itself and responsible for its successful management.
2. The courts, viewing the matter largely from the standpoint of the constitutional rights of the owner to the possession of and just compensation for the use of his property.
3. The regulatory commissions whose relations to the public utilities and railroads require not only observance of the constitutional rights of owners of the property but also careful consideration of the interests of the public in reasonable, nondiscriminatory rates, adequate service, and safe operation, all of which require that the commissions keep closely in touch with the financial and operating problems of management."

Our purpose has been to confine the discussion principally to so-called "depreciation charges" or, more accurately, "retirement expense," as distinguished from "depreciation," as a factor in determining present value of property. We have , however, considered the valuation phase of the matter sufficiently to note the necessity for consistency in the methods of dealing with both phases of the subject.

We have noted a controversy as to the purposes for which so-called "depreciation" or "retirement expense" charges are made against income in advance of the retirement of property. On the one side it is argued that the only purpose of such charges is to secure a continuation of productive capacity and efficient operation thru provision for replacements and renewals. On the other side it is argued that the sole purpose of such charges is to preserve unimpaired the investment in the enterprise. The first recognition of these ideas in an important court decision was in the oft-quoted Knoxville decision of the U. S. Supreme Court in 1909. In this case the court stated that it was the duty of a public-utility company to its owners and also its duty to the public to make provision for replacements. If this view of the court is accepted, there would then seem to be little point to the argument as to which purpose is most "fundamental." At least, from a practical viewpoint, it would seem that these purposes are entirely consistent, and that the achievement of one cannot leave the other unachieved; that is to say, if the investment is maintained unimpaired, there should be no difficulty in making the renewals necessary to perpetuate the service, and that, conversely, if necessary renewals are made, keeping the property's operating capacity and earning power undiminished, there is little likelihood of the investor suffer-ing thru impairment of investment.

It has been noted that the extent to which depreciation or retirement-loss charges must be made against income on estimates of such losses depends upon -

1. Whether our conception of "depreciation" embraces (a) the elapsed-life-of-each-unit theory, commonly known as the "straight-line" theory, (b) the modification of this theory, known as the "sinking-fund" basis, or (c) the less theoretical "retirement-loss-equalization" method, which has been quite widely used by state commissions and utilities.
2. Where the dividing line is drawn as between (a) classes of property the replacement of which is provided for by reserves, and (b) classes of property the replacement of which is charged direct to operating expense.

With reference to the theory on which depreciation charges are computed, we have observed the views quite generally held by representatives of public utilities and state regulatory commissions, from which extensive quotations have been made, to the effect that when repairs and replacements are made sufficient to keep the property at a high point of productive efficiency there is no substantial lessening of value for rate-making purposes or depreciation in the sense of impairment of investment. Consistent with this view of investment values it is also held that, there being no such loss in value, there is no reason for setting up larger reserves than needed for actual replacements; that if no theoretical or assumed loss need be charged to operation and collected from consumers for the purpose of counteracting a theoretical nonexistent loss in value.

The opinion of the various groups of utilities in connection with depreciation in the sense of impairment of value may be briefly stated as follows:

The representatives of the electric and gas industries hold that there is practically no depreciation of property, as the plant is maintained in a high state of efficiency with its productive capacity undiminished. Substantially, the same position is taken by the electric-railroad and steam-railroad representatives. The water-utility representatives are not so clearly on record so far as the industry as a whole is concerned, but, as we have noted, seem to favor the sinking-fund method as against the straight-line method of dealing with depreciation. The telephone companies take the position that the value of property expires day by day in proportion to the shortening of life of individual parts. They take this position, however, only in considering the charge to operation to create reserves. In connection with valuations, they abandon this theory and adopt the "inspection" method to determine the accrued depreciation or loss in value.

The question as to where the line shall be drawn as between charges to current maintenance and depreciation, the consensus of opinion among public-utility managements is that some portion of the replacements should be provided for by reserves. There is no very definite agreement of opinion as to where the dividing line shall be drawn as between the classes of items, the replacement of which shall be treated as repairs or current maintenance and charged direct, and those that shall be provided for by reserves. Practices differ quite a bit in this respect. Some companies prefer to charge all repairs and replacements direct to operating expenses and employ no reserve.

No one favors providing a reserve for all of such charges. The utilities favoring the theoretical or straight-line method - namely, the telephone companies, are charging to operation direct as "repairs" or "maintenance" amount approximately equal to the amounts that they are setting aside in reserves. Some of the replacements which they charge direct to operations, and thereby concede may be cared for properly without a reserve, are items in which the loss is accruing during several years just as truly as in the case of the items for which they provide reserves. To this extent the theory that a reserve must be provided for all "accrued loss" representing elapsed life is not applied.

It is, of course, highly important that each company shall use care to see that it does not create reserves for a given kind of items and then charge the replacements again to operating expense direct, thus duplicating the charge, or, on the other hand, fail to provide in the reserve for the class of charges made against it.

The distinction made in the classification of accounts approved by the National Association of Commissioners and adopted in many states is found in the following language: "The cost of replacing minor parts, which is not recorded by any entries in the fixed-capital accounts, and which is commonly called the cost of repairs or maintenance as distinguished from the cost of replacements of large units, need not be provided for thru retirement reserve." * * * The retirement reserve is intended to "equalize from year to year, as nearly as practicable, the losses incident to important retirements of buildings, dams, etc., or of large sections of continuous structures, like electric lines (also gas mains or water mains) or of definitely identifiable units of plant and equipment."

The Interstate Commerce Commission has never required the railroads to set up any depreciation except on locomotives, freight and passenger cars, and other rolling stock. A reserve has not been required for ties, rails, bridges, buildings, and other roadway property. As to a large part of the property, the reports of the Depreciation Section of the Commission concede the impracticability of providing reserves by depreciation accounting.

Some of the economic aspects of depreciation as related to public utilities involve such matters as the characteristics of the business from the standpoint of permanency, the unity of the enterprise as a single instrument of service, and practical considerations with which the investor concerns himself. As the straight-line theory of depreciation is advanced on the ground that its use is required in order to protect the investment from impairment, it has seemed pertinent to inquire as to its effectiveness for that purpose. Our investigation leads to the conclusion that while reserves created under this theory are much larger than it is possible to use during the existence of the property as a going concern, they are not sufficient to cover more than a fraction of the loss that would ensue should the business come to a fairly abrupt termination.

In connection with any proposition advanced for the investor's protection, it seems appropriate to ascertain his views on the question. This we have done so far as records permit, and find little evidence of concern as to the method of providing for depreciation or as to whether reserves are created to any particular extent. His interests appear to be intelligently discussed and his rights duly recognized in the decision of the Supreme Court of the State of Oklahoma, previously quoted, to the general effect that when present and future earning power of the property is assured his interests are fully protected.

Another point, to which attention has been directed as being of vital importance to investors, is the necessity for consistency in the treatment of depreciation as related both to valuation and to charges against income. The application of a theory of depreciation proclaimed as necessary to protect the investor from loss is in fact the very instrument which may be used against him with most telling effect when deductions are made from valuation merely on theories of expired value without opportunity to make good out of earnings the loss computed against him; that is, the difference between his original investment and theoretically depreciated investment used as the basis for determining the amount that he shall be allowed to earn.

When a tribunal of last resort names a specific amount as representing the value of rate base of a property, it thereby practically determines its value to the owner, for property employed in such business has value in proportion to its assured earning power. If such a tribunal, when dealing with a property having an investment of, say $100,000, concludes that notwithstanding the fact that it may be operated as good or better than when operation began, with evidence of ability to make all necessary renewals for its perpetuation, but, because of age in some of its parts, it is worth $90,000, such a tribunal may by its decree destroy ten thousand dollars of investment, unless the utility is permitted to recover this amount thru an equitable adjustment of rates.

Examination of the various decisions quoted discloses that the first decision of the Supreme Court on the subject denies the right of a company to make charges to operating expenses before expenditures for replacements are actually incurred. In the Knoxville decision the court takes a definite position in favor of providing in advance for the replacement of property. This decision lends more support to the straight-line theory of depreciation than do any of the later decisions. The court, however, does not in this case specify any particular method of providing for replacements, but speaks of making provision for "replacing the parts of the property when they come to the end of their life." This is what is done under any of the methods of providing for depreciation which we have discussed.

The Cumberland Telephone and Telegraph case, decided a month later than the Knoxville case, does not seem to enlarge upon the court's views previously expressed, except that objection is found to using depreciation-reserve moneys for additions to plant and including such additions in the rate base.

In the Lincoln Gas and Electric case the court appears to recognize the fact that depreciation may be provided for either by direct charges to expense or thru reserves, but warns against duplication by using both methods.

The Kansas City Southern case clearly holds that losses resulting from obsolescence and inadequacy are a charge against future earnings, and, therefore, not to be provided for by reserves. This case also recognizes that a company may, if it sees fit, anticipate general depreciation and make provision therefor, but if this is not done the abandonment should be charged to present or future operating expenses.

In the Minnesota rate cases it is not clear just how far the court goes in recognizing theoretical depreciation. The court, however, does refer to the "actual existing depreciation" by using as an example of such depreciation "old structures and equipment remaining on hand." This does not suggest adherence to the theoretical or elapsed-life theory. The property referred to by way of example is property the usefulness of which would seem to have practically expired.

In New York and Queens Gas case the Supreme Court, accepting the findings of the Master and the lower court, approves a direct repudiation of the theoretical or straight-line theory of depreciation.

In the Galveston case the position of the Supreme Court is not entirely clear. A substantial amount of deferred maintenance was recognized, but was not deducted from valuation. The company was to be allowed to restore property to its proper condition by putting into it the deferred maintenance. This suggests that such depreciation is not to be regarded as representing value absolutely gone, but that restoring property "to proper operating condition" would make good the loss which seemed imminent - the loss which on the straight-line theory would be regarded absolute and would have to be deducted in determining value.

A recent decision of the U. S. District Court in the New York Telephone case (previously quoted) holds that the amount of the depreciation reserves invested in the company's property should not be taken as a measure of depreciation to be deducted in determining value for rate-making purposes. However, a still more recent decision from a court of equal authority (U.S. District Court of Maryland) approved the deduction of an amount equal to the reserve carried on the books (after an adjustment as to price levels, which is explained in the quotation from the decision hereinbefore made), where the reserves had been reinvested in the company's property.

A study of the decisions of courts and commissions from which quotations have been made, and others of like character, leads to the conclusion that there is a decided tendency to revise earlier opinions and rulings concerning depreciation. Some progress, at least, is being made in this direction. The regulatory commissions, while not all working along identical lines of procedure, show a tolerably well-defined tendency to get away from the straight-line depreciation theories and adopt methods, the administration of which is practicable and which are designed to secure fair dealing as between the investor and the user of the service. In the recent decisions which we have noted, there is no idle speculation as to "service lives" of the tens of thousands of units in the plants of public-utility companies. The "delusive exactness" so conspicuous in the discussions of the earlier cases has given place to more practical statements and methods of measuring the needs of the companies for plant upkeep. The whole proceeding takes on the appearance of a businesslike consideration of problems by men experienced and informed with reference to the matters under consideration.

The matters submitted to the Federal Courts for determination, so far as depreciation is concerned, are limited to questions as to -

1. The proper allowance of income for depreciation or retirement losses.
2. What amounts, if any, shall be deducted from valuation in arriving at value of property for rate-making purposes.

The regulatory commissions in considering the adequacy of a given net income must consider, not what will barely escape being adjudged confiscatory, but what is fair and reasonable under all the circumstances, and sufficiently liberal to attract new capital to meet the expanding needs of the public for utility service. A body whose duty it is to decide upon questions affecting the adequacy, quality, and continuity of service, protection of the public from the hazards of unsafe operating practices, and other questions affecting the public welfare, must be guided by broad considerations of public policy rather than by the limited legal aspects of the matter.

The commissions and the utility managements, by adopting and consistently following rational methods in the treatment of depreciation, can do much to clarify this subject, with the result that more even-handed justice may be done to the users of the service and those who provide the capital which makes the service possible. To accomplish this purpose, it will be necessary that utilities do not present one theory in dealing with valuation and another in dealing with operating charges in handling their cases before commissions and courts. Likewise, rigid adherence to consistent methods on the part of the regulatory commissions is of the utmost importance. Any other practice simply means confusion and ineffective regulation. When the treatment accorded the subject by utilities and regulatory commissions reveals a consistent and comprehensive understanding of the problem, there is little doubt that the correct principles will be permanently established in the decisions of the higher courts.

Reader's Test of Subject Matter in Chapter V

The following questions are given to enable the reader to check himself as to his grasp of the important points discussed under the subject, "Depreciation and the Retirement of Property."

1. Distinguish between depreciation from the standpoint of capital and from the standpoint of income.
2. Explain the use of the terms "retirement expense" and "depreciation charges."
3. Explain the two views, (a) that depreciation reserves are provided for the purpose of maintaining productive capacity and operating efficiency, and (b) depreciation reserves are provided for the purpose of maintaining values.
4. What authorities are cited in support of each view?
5. Explain three methods of computing depreciation and point out the advantages or disadvantages in each case.
6. State the substance of the instructions regarding the operation of the retirement-expense and the retirement-reserve accounts as embodied in the accounting system approved by the National Association of Railway and Utilities Commissioners.
7. What provisions do the National Association of Commissioners make for charging retirements to future operations?
8. What are the opinions stated in regard to the extent to which retirement losses should be anticipated?
9. Summarize the decisions of the courts as to the recognition of depreciation as an element in valuation.
10. Outline the position of the various classes of utilities on the treatment of depreciation or retirement losses.
11. Compare the position of utility operators with that of various regulatory commissions on the matter of depreciation.
12. How do commissions determine the amount of income necessary for the upkeep of property without establishing specific percentages for depreciation or retirement expense.
13. Outline some of the characteristics of the public-utility business in relation to the loss of investment values as a result of depreciation.
14. What is the significance of the following statements:
    (a) The public-utility business has no need for the large reserves resulting from the application of the straight-line method.
    (b) If the utility business is to be considered one to be liquidated, the usual application of the straight-line method does not protect the investment.
15. What are the advantages and the disadvantages of reinvesting in additions to plant the depreciation-reserve moneys set aside for replacements.

CHAPTER VI

THE UTILITY RATE PROBLEM

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The essential points brought out in this section are briefly summarized in the following:

1. Five main steps in rate-case procedure are discussed.
2. Fair value of property used is the basis on which commissions and courts allow a return to the owners of public utilities.
3. Original cost and reproduction cost receive most consideration in determining fair value.
4. Commissions are guided by court decisions where courts have given clear expression to fundamental principles.
5. Cases are summarized, showing the predominant elements in fixing the rate base.
6. There is much controversy as to the consideration to be given to reproduction cost in determining value for rate-making purposes.
7. National Association of Commissioners' classifications of accounts provide for the inclusion in fixed capital of the excess cost, if any, of replacements over the cost of retired units.
8. In determining the existing depreciation the commission should have the benefit of careful studies by accountants and engineers.
9. The accounting report to the commission in a rate case should show the history of the property and a detailed classification of the cost thereof.
10. When records of original cost are incomplete, much valuable information bearing on the question may be obtained thru an investigation of the amount of money actually invested.
11. Treatment of gifts, grants, and donations of property.
12. Property not used and useful is generally excluded in valuations for rate making.
13. Property owned but leased to others and property of others used in operations require special consideration.
14. Various theories of determining going value are discussed.
15. In valuations for rate making, consideration is given to working capital.
16. Companies operating two or more utilities must apportion the property jointly used, to determine value of property used for each class of utility service.
17. The commission in a rate case must ascertain the cost of operation.
18. The cost of serving the consumer is usually divided into. (1) Customer cost, (2) Manufacturing cost, and (3) Investment cost.
19. Methods of apportioning costs are discussed and illustrated.
20. Consumers' statistics are explained and statement forms illustrating their use in forming rate schedules are given.

THE UTILITY RATE PROBLEM

The Rate-Making Situation. - The making of rates involves questions of engineering, accounting, finance, economics, law, and public policy. In each of these fields there exists considerable differences of opinion, both as to fundamental principles and as to methods of procedure. Regulatory commissions of different states often proceed by different methods, and in some matters disagree on principles and their application to particular situations. On many important points there are no judicial interpretations of the law from which conclusions may be clearly drawn as to the legal effect of particular facts and circumstances. There are, however, certain principles of rate making which are now generally recognized and which may be regarded as fairly well established in practice. In the application of these principles to the solution of the rate problem, certain methods of orderly procedure have been developed. With these methods, an acquaintance should be made by all who are concerned in any way with the collection, preparation, presentation, or consideration of information or evidence in a rate proceeding.

This chapter will deal with the nature, extent, and use of accounting records in rate-case proceedings. The processes involved in the review of rates by a regulatory commission, or by a regular court, are described in some detail.

Cost is the most controlling factor in rate making. The determination of cost is chiefly an accounting problem. Many other matters incident to rate making which must have the attention of the engineer, lawyer, economist, and commission or court, must also have shed upon them such light as the accounts and records can furnish when properly exhibited and interpreted.

Because of the many ramifications of the accountant's duties, and the various angles from which the facts disclosed by the records may be viewed, it is most important that the accountant have a competent knowledge of the various aspects of a rate case.

The problems requiring consideration in a rate case may be considered in five main groups, related to each of which are various subsidiary issues.

Order of Procedure in a Rate Case. - Briefly stated, the order of procedure in a rate case is as follows:

1. Investigating and deciding value of property.
2. Determining cost of operation.
3. Determining return on investment.
4. Ascertaining the gross revenue required.
5. Preparing rate schedules.

Assuming figures for purposes of illustration, the foregoing steps may be indicated as follows:

1. Fair value	$50,000,000
2. Operating expenses(one year)	8,000,000
3. Return - rate 8% Amount 8% of $50,000,000)	4,000,000
4. Gross revenue required(total, items 2 and 3)	12,000,000
5. Rates that will yield $12,000,000 (Discussion of methods of determining upon a combination of rates that will produce a required amount of revenue will be explained under heading, "Consumer Statistics").	

The general scope of the accountant's work in rate determinations, where a complete investigation is required, comprehends the following:

1. Valuation Investigation

    (a) Secure a record of the original cost of plant and equipment when first built, and all additions and betterments since.

    (b) Ascertain the amount of capital which represents the actual present investment in the property devoted to public service. This may or may not coincide with the original cost to date.

    (c) Obtain cost of various classes of property, as land, buildings, etc., separated in accordance with standard classification of accounts.

    (d) Ascertain the items of property retired and the cost thereof, and whether written out of fixed-capital accounts.

    (e) Ascertain amount of funds used and necessary for working capital.

    (f) Obtain all available facts which might aid in determining the allowance for going value.

2. Cost of Operation

    (a) Ascertain the actual operating expenses, including depreciation and taxes.

    (b) Determine as accurately as possible the prospective changes in cost and the effect that such changes will have on operating expenses.

3. Gross Revenue and Income

    (a) Ascertain the amount of gross revenues resulting from the operation of the property under existing rates for service.

    (b) Ascertain the net income under existing rates for service and the prevailing operating cost incurred in producing such income.

    (c) Indicate the effect on net income of prospective changes in operating cost, and also prospective changes in volume of traffic or sales and their effect on income.

4. Consumer Statistics and Rate Schedules

(a) Obtain a survey of the service rendered, analyzing it in such manner as will furnish an adequate basis for the construction of rate schedules that will be fair and equitable to all customers and that will yield the required net income.

The field of the accountant in dealing with rate problems is not clearly defined. Certain kinds of operating statistics may in one organization be prepared and submitted by a member of the engineering staff, while in other organizations the same kind of work is delegated to a section of the accounting or statistical department. Owing to this lack of definition, it may appear to some that part of the matter here introduced is outside of the accountant's field, while others with a different perspective may feel that matter which should be submitted in an accounting treatise has been omitted.

Value for Rate-Making Purposes. - The fair value of the property used and useful in the public service at the time it is being used for the public is the basis used by commissions and approved by the highest court for computing the return allowed to the owners of public-utility property. One of the frequently quoted decisions is that of the U. S. Supreme Court in the case of Smythe v. Ames (169 U. S. 466), in which the court said:

> "We hold, however, that the basis of all calculations as to the reasonableness of rates to be charged by a corporation maintaining a highway under legislative sanction must be the fair value of the property being used by it for the convenience of the public. And, in order to ascertain that value, the original cost of construction, the amount expended in permanent improvements, the amount and market value of its bonds and stock, the present as compared with the original cost of construction, the probable earning capacity of the property under particular rates prescribed by statute, and the sum required to meet operating expenses are all matters for consideration, and are to be given such weight as may be just and right in each case. We

> do not say that there may not be other matters to be regarded in estimating the value of the property. What the company is entitled to ask is a fair return upon the value of that which it employs for the public convenience. On the other hand, what the public is entitled to demand is that no more be exacted from it for the use of a public highway than the services rendered by it are reasonably worth."

The principles stated in this decision marked a most important step in the development of rate-making theory and practice. Nevertheless, it is evident that this decision left much unsettled as to what constitutes either "fair value" or "fair return" upon the fair value. The court names six elements to be considered in determining "fair value," and intimates that there may be others. It is stated that each element is to be "given such weight as may be just and right in each case." The decision, however, sheds but little light on the question as to what is "just and right in each case" or the processes by which it may be determined.

Following the decision in the Smythe v. Ames case quoted from above, the court in the following year, in the case of the San Diego Land and Town Company v. National City, said:

> "The contention of the appellant in the present case is that in ascertaining what are just rates the court should take into consideration the cost of its plant; the cost per annum of operating the plant, including interest paid on money borrowed, and reasonably necessary to be used in constructing the same; the annual depreciation of the plant from natural causes resulting from its use; and a fair profit to the company over and above such charges for its service in supplying the water to consumers, either by way of interest on the money it has expended for the public use, or upon some other fair and equitable basis. Undoubtedly all these matters ought to be taken into consideration, and such weight be given them when rates are being fixed as under all the circumstances will be just to the company and to the public. The basis of calculation suggested by the appellant is, however, defective in not requiring the real value of the property and the fair value in themselves of the services rendered to be taken into consideration. What the company is entitled to demand, in order

that it may exceed "what it ought to have cost." It is stated that "the reasonable value of the property at the time it is being used for the public" is the basis upon which a return

being used for the public" is the basis upon which a return

is to be allowed.

It should be here noted that the court in contrasting the present value with actual cost makes no mention of changes in price levels of materials and labor affecting construction costs, but makes the distinction on the ground that "the property may have cost more than it ought to have cost." Neither is there anything in the language of the court indicating that it was considering the possibility that a plant of different type, but equivalent in service value to the existing plant, could be produced at a less cost. *The property being used* is the only property mentioned. Apparently the purpose of the court in accepting present value instead of actual cost was to guard against including in the valuation costs which were excessive at the time incurred.

Factors Requiring Consideration in a Valuation. - As the decision in the Smythe v. Ames case has been referred to as a precedent by the Supreme Court and by other courts and commissions in almost every important rate case in the last twenty-seven years, let us examine the matters mentioned by the court as requiring consideration in a valuation. The matters mentioned by the court bearing on value are:

1. Original cost of construction.
2. Amount expended in permanent improvements.
3. Amount and market value of bonds and stock.
4. Present, as compared with the original cost of construction.
5. Probably earning capacity of the property under particular rates prescribed by statute.
6. The sum required to meet operating expenses.

The first two items mentioned by the court, "original cost of construction" and "the amount expended in permanent improvements," are generally considered together under the designation "original cost."

A review of the decisions in valuation cases indicates that comparatively slight attention has been paid to the elements referred to as "market value of bonds and stock" and "earning capacity." In fact, these factors cannot consistently be accorded great weight in a valuation for rate-making purposes. Earning capacity depends largely upon rates, while the market value of bonds and stock depends largely upon earnings, which in turn are largely controlled by the rates for service. If "fair value" is to be determined by earnings, and the rates producing the earnings are excessive, the resulting value must be excessive, and, therefore, excessive rates would have to be perpetuated, because they have created a higher property value which, in turn, calls for high rates to pay a return on the increased value. If the rates in question are insufficient, the same processes of rate making would keep them insufficient by indicating a low value of the property.

The court mentioned "the sum required to meet operating expenses" as an element to be considered in determining valuation. Of course, operating expenses are in no way a component element of plant-construction costs. Whatever bearing they may have on valuation is of a very indirect character. Possibly the court had in mind the thought that property located, constructed, and managed so as to result in unusually efficient operation should be considered as having a greater value than a plant costing the same for construction but requiring heavier operating costs.

Let us now consider the more substantial elements mentioned by the court as "original cost of construction," "amount expended in permanent improvements," and "present, as compared with original cost of construction." These are more briefly referred to as "original cost" and reproduction cost."

Original Cost and Reproduction Cost. - An examination of a long line of decisions of commissions and of state and Federal courts discloses the fact that the matters receiving most consideration in the determination of fair value for rate-making purposes are:

1. Original cost.
2. Reproduction cost.

By "original cost" is meant actual original cost of construction, including organization and other intangibles, to which is added the cost of additions and betterments properly chargeable to fixed-capital accounts and from which is deducted the cost of retired property. By "reproduction cost" is meant an estimate of the cost to reproduce or to construct a plant similar to the one under investigation. These two bases of valuation may be regarded as constituting the groundwork for all valuations for rate making. Consideration must also be given to numerous other matters, among which is the question of existing depreciation. But these matters are subsidiary to the two main elements named above, and are considered in relation to these elements.

A controversy as to whether original cost of property used and useful in the public service or whether the amount that it would cost if it were to be reproduced at the date of the investigation should be accepted as the basis of valuation of public-utility property for rate-making purposes has been in progress for many years. Interest in the subject has been intensified during the last few years, because of the enormous increase in costs of construction which very materially widens the difference in the results obtained under these two bases of calculation. Decisions of the United States Supreme Court in several cases disposed of recently have dealt with this question. To a large extent, however, the recent decisions of the court simply restate opinions expressed in earlier cases. The court has held to the position taken by it about thirty years ago that the valuation on which a return is to be allowed must represent the "present fair value" of the property. It is stated that consideration must be given to the current cost of materials and labor at the time the investigation is made. The court, however, does not say that estimated cost of reproduction at a given date is "fair value" as of that date but that such estimates must be given "consideration."

Opinions of Courts on Present Fair Value and Original Cost. - That the court has not removed all doubt as to the weight to be given reproduction-cost estimates, is evidenced by the fact that many able lawyers, accountants, and economists in the United States are now taking different views as to what the court really intended to say on this subject. There appears to be a wide divergence of views on this point among the justices of the United States.

In one of the important decisions of the court (Southwestern Bell Telephone Co. v. Public Service Commission of Missouri, (43 Sup. Ct. Rep. 544,) handed down in May, 1923), Mr. Justice Brandeis wrote an opinion dissenting from the majority opinion of the court as to the effect to be given to reproduction cost. The dissenting opinion is probably as forceful a statement of the reasons in support of original cost and as clear an exposition of the objections to reproduction cost as is to be found in the literature on this subject.

In the case of the Georgia Railway and Power Company v. Public Service Commission of Georgia (67 L. ed. 723, 43 Sup. Ct. Rep. 680), decided in June, 1923, the court, in general, reaffirmed the position taken in the Southwestern Bell Telephone case, but reached results which are somewhat difficult to reconcile with the language of the court in the Southwestern Bell case, relative to current prices of labor and materials. The decision of the court in this case was written by Mr. Justice Brandeis, while Mr. Justice McKenna wrote a vigorous dissenting opinion expressing the view that the position of the majority of the court was contrary to that taken in the former case. These decisions represent the latest opinion of the court on these matters.

In the Southwestern Bell case the Supreme Court said:

> "In Wilcox v. Consolidated Gas Co., 212 U. S. 19, 41, 52, 53; L. ed. 382; 48 L.R.A. (N.S.) 1134; 29 Sup. Ct. Rep. 192; 15 Ann. Cas. 1043; this court said:
>
> "'There must be a fair return upon the reasonable value of the property at the time it is being used for the public. * * * And we concur with the court below in holding that the value of the property is to be determined as of the time when the inquiry is made regarding the rates. If the property, which legally enters into the consideration of the question of rates, has increased in value since it was acquired, the company is entitled to the benefit of such increase.' Editor's note: This decision was rendered Jan. 4, 1909.
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> "In the Minnesota Rate Cases, 230 U. S. 352, 454; 57 L. ed. 1511; 48 L.R.A. (N.S.) 1151; 33 Sup. Ct. Rep. 729; Amn. Cas. 1916A, 18; this was said:
>
> "'The making of a just return for the use of the property involves the recognition of its fair value if it be more than its cost. The property is held in private ownership and it is that property, and not the original cost of it, of which the owner may not be deprived without due process of law.'

> "It is impossible to ascertain what will amount to a fair return upon properties devoted to public service without giving consideration to the cost of labor, supplies, etc., at the time the investigation is made. An honest and intelligent forecast of probable future values made upon a view of all the relevant circumstances is essential. If the highly important element of present costs is wholly disregarded, such a forecast becomes impossible. Estimates for to-morrow cannot ignore prices of to-day."

In the Georgia Railway & Power Company case the Supreme Court said:

> "The case is unlike Missouri ex rel. Southwestern Bell Telephone Co. v. Public Service Commission, No. 158, decided May 21, 1923. Here the commission gave careful consideration to the cost of reproduction; but it refused to adopt reproduction cost as the measure of value. It declared that the exercise of a reasonable judgment as to the present 'fair value' required some consideration of reproduction costs as well as of original costs, but that 'present fair value' is not synonymous with 'present replacement cost,' particularly under abnormal conditions. *** The lower court recognized that it must exercise an independent judgment in passing upon the evidence, and it gave careful consideration to replacement cost. It is likewise held that there was no rule which required that in valuing the physical property there must be ' a slavish adherence to cost of reproduction less depreciation.' *** The refusal of the commission and of the lower court to hold that, for rate-making purposes, the physical properties of a utility must be valued at the replacement cost less depreciation was clearly correct. As was said in Minnesota Rate Cases,(230 U. S. 352, 434,)'the ascertainment of that value is not controlled by artificial rules. It is not a matter of formulas, but there must be a reasonable judgment, having its basis in a proper consideration of all relevant facts.'
>
> "What these relevant facts are had been stated in Smythe v. Ames,(169 U. S. 466, 546, 547) and in Willcox v. Consolidated Gas Company,(212 U. S. 19, 52). The rule laid down in these cases was expressly recognized as controlling, both by the commission and by the lower court."

Commissions Guided by Court Decisions when Possible. - There are many other decisions in which original cost, reproduction cost, and related matters are discussed, but the above quotations will give a very good idea of the rules laid down by the Supreme Court as to these matters. They constitute the rule by which state commissions and other agencies making valuations for rate-making purposes must be guided. The problem of the commission or valuator is to find a value that will be adjudged as giving to original cost and reproduction cost such consideration as the court holds to be proper. In the telephone case mentioned above, the fair value found was approximately midway between original cost and reproduction cost. In the Georgia Railway case the amount arrived at by the court was substantially original cost with the exception of land, which was included at present values. The court also appears to have given consideration to the fact that some portions of the property were installed at a cost higher than prevailed at the date of the valuation.

There is a great difference of opinion among lawyers and others as to whether, in the position taken during the last year, the court has indicated a modification of its earlier views as to the effect to be given to reproduction cost and the extent, if any, to which they have been modified. As we have already noted, not all members of the court itself agree that its conclusions are in accord with the principles stated by it.

The Wisconsin Supreme Court, in a recent decision (Wisconsin-Minnesota Light and Power Company v. Railroad Commission of Wisconsin) referring to the recent decisions of the U. S. Supreme Court, said:

> "It is very difficult, if not impossible, to deduce from the three cases what weight is to be attached to cost of reproduction new less depreciation, altho in two cases the judgements appealed from were reversed because sufficient weight was not given to that factor."

Summary of Cases Showing Basis of Valuation. - Justice Brandeis (U. S. Supreme Court) has summarized the cases reported in Public Utility Reports during the years 1920, 1921, 1922, and 1923 (to March 31), in which the rate base or value was passed upon (such cases numbering 363), as follows:

> "The following summary shows the predominant element in fixing the rate base in the several cases:
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> "In 5 cases: Reproduction cost at unit prices prevailing at the date of the valuation.
>
> "In 28 cases: Reproduction cost at unit prices prevailing at some date, or the averages of some period, prior to the date of valuation.
>
> "In 12 cases: Reproduction cost at unit prices prevailing at some date not specifically stated.
>
> "In 22 cases: Reproduction cost of an inventory of a prior date at prices prevailing at that date or prior thereto, plus subsequent additions at actual cost (so-called split inventory method).
>
> "In 3 cases: Reproduction cost on basis of future predicted prices (so-called trend prices, or new plateau method).
>
> "In 102 cases: A prior valuation by the commission plus the actual cost of subsequent additions.
>
> "In 85 cases: The actual original cost (including both initial cost and additions).
>
> "In 6 cases: Original cost arbitrarily appreciated.
>
> "In 27 cases: The historical cost or prudent investment.
>
> "In 28 cases: Book cost or investment.
>
> "In 12 cases: Bond and stock capitalization.
>
> "In 36 cases: Determination and classification of method impossible."

Views of Utilities and Public on Reproduction Cost. - In passing this subject it may be observed that at the time when the Smythe v. Ames case was decided, and for some years thereafter, the utilities advocated original cost or actual investment as the rate base, while the public authorities advocated reproduction cost. At that time, reproduction-cost estimates usually were lower than book values. There were at that time, in many cases at least, sufficient reasons for questioning the book figures as correctly showing the actual investment. It is a well-known fact that prior to 1900 systematic keeping of fixed-capital accounts involving the writing off of retired property was quite uncommon. But there was also the general belief that owing to a period of declining prices the acceptance of reproduction cost would result in a lower valuation than original cost or investment. We now find a complete reversal of position, both on the part of the public and of the public utilities generally. The utilities now contend for valuations giving dominant effect, or at least substantial effect, to reproduction cost, while those presenting cases to the commissions in behalf of the users of the service are contending for the original cost or "prudent investment" basis.

Possible Affects of Reproduction-Cost Valuations on Investors. - The history to be written on this subject during the next few years will be of deep concern to investors in public utilities and the public generally. During the past eight years construction costs have been relatively high, and during this same period there has been an extraordinary growth in public-utility business, requiring very large additions to plant capacity.

This is especially true of the electric light and power business, in which the demand for service has required many companies to double their investment during the past few years. Much of this investment represents long-lived property. As it has been installed during the period of higher construction costs, a decline in material and labor costs during the next few years might place some of these utilities in a most embarrasing financial condition, in case the courts should hold that dominating effect should be given to reproduction cost at date of valuation, as is advocated by some utility representatives at the present time. The securities (to a large extent long-term issues at relatively high interest rates) issued to finance such additions are substantially equal to the amounts expended for the additions to property. Therefore a considerable shrinkage of value as reflected in a reproduction-cost valuation could seriously impair the ability to cover interest and dividend requirements.

The utilities that would be hardest hit in such circumstances would be those that have made the largest investment to meet the demands for service during the World War and following. Companies that were not required to make large investments during the period of high prices would, of course, fare much better.

Excess Cost of Replacements. - The accounting rules contained in the classification of the National Association of Railway and Utilities Commissioners provide for the inclusion in fixed-capital account of the excess cost, if any, of replacements over the cost of the retired units. This is accomplished by crediting the plant account with the cost of the retired unit and charging the plant account with the cost of the new unit installed. This rule applies to all elements of the property that can be satisfactorily individualized. Where this is impossible, as is the case with minor items and certain continuous structures, it is provided that the repairs and renewals necessary to keep the property in efficient operating condition shall be charged direct to the maintenance accounts and that no provision therefor be made in retirement reserve.

As the retirement reserve provides only for the original cost of retired property (limited, of course, to the classes for which reserves are created), practically the only course open is to capitalize the excess cost of renewal over the cost of the property retired. To provide for such cost out of earnings would be unfair to the consumer, as it would make him pay for part of the property of the utility.

If the consumer returns to the company thru revenues set aside for retirement losses an amount that will reimburse the company for the original cost of the property when retired, he does his full duty. He should not be asked to pay the cost of improving, enlarging, or extending the property. Even tho no improvement is made, as in the case of a new boiler of similar capacity and kind to the old, but costing more, on account of higher prices prevailing, the excess cost should be capitalized. In this way the consumer pays a return on the additional capital required for use in his service.

When property is replaced at a cost less than the cost of the units retired, the accounting will be the same as above outlined, but, of course, the capital accounts will be decreased as a result of the replacement transaction.

As a result of including in fixed-capital accounts the cost of new equipment used for replacements and deducting the original cost of retired property, the capital account is kept more in line with the actual value of the property as expressed in current prices at a given time and, therefore corresponds more nearly with both the cost of reproduction and the exchange value.

Current Prices of Material and Labor Considered. - In making valuations for rate-making purposes, the "fair value," as fixed by commissions and approved by courts, gives consideration to current prices of materials and labor. The "reproduction cost" of the property usually submitted as one element to be given weight in arriving at a judgment as to "fair value" is based on the estimated cost of reproducing the property; in other words, it is an estimate of the cost to construct a property similar to the existing property as of the date, or approximately the date, at which the valuation is to be established. If such a valuation is made at a time when materials and labor prices have been rising for several years, the reproduction cost will necessarily be considerably greater than the actual cost or investment. If the accounting practice has been to charge all excess cost of replacements to operating expenses, and if the consumer has paid in revenues amounts sufficient to cover such expenses, plus a reasonable return on the investment, he may be said to have paid in rates the excess cost of the replacements over the cost of the original units that were paid for from capital funds. If, then, an appraisal of the property of the utility is made on the reproduction basis at current prices of labor and materials, such appraisals reflect the same elements, included in the appraisal as a capital item, as were reimbursed to the company by the consumers as an element of operating cost. This introduces a duplication, effect being given to the same element of cost both in valuation and in operation. The result of this duplication may be shown by the following illustration:

Capitalizing Excess Cost of Replacement Illustrated. - The original construction cost of a plant was $100,000. Of this original plant, portions costing $50,000 have been retired and replaced with property costing $90,000, all of which has been charged to operating expenses as replacements. The books, therefore, still show the plant account at $100,000, altho the actual cost of the property in service is $140,000. The 40,000 of increased cost, being charged to operating expenses, presumably has been paid for by consumers. If a valuation were now made by a commission using book values as representing original cost, the finding of value would be $100,000.

If reproduction cost be used, the amount of the valuation would be $140,000. If a return of 8 per cent on the valuation were allowed, the company would receive a return per annum of $11,200. If the book value of $100,000 were used, the return would be $8,000 per annum, or $3,200 less than on the valuation of $140,000.

If the consumer can be considered to have paid the $40,000 excess cost of replacements added to the valuation by the use of the reproduction-cost basis, he would now pay $3,200 per year on the same $40,000 which he had previously paid in rates. If the books show the $40,000 in fixed-capital account instead of in operating expense, the consumer would, of course, pay the annual amount of $11,200 (being 8 per cent on $140,000), but would not be required to pay the $40,000 in addition thereto.

As the courts have held that in valuing the property consideration must be given to reproduction cost, the only way to minimize or prevent the results described is to include in the fixed-capital accounts the actual cost therefor, thereby keeping it out of the operating-expense accounts.

Existing Depreciation. - The amount of depreciation actually existing in the physical property at the date of valuation is a subject for the engineer's consideration. Accounting records will show the history of retirements in past years, the adequacy or inadequacy of the provisions made therefor thru a depreciation or retirement reserve, and the amount in the reserve at the date of valuation. The accounting records should also furnish information as to the age of different classes of property and the amount of salvage that has been received upon the retirement of property. This information should be of use to the engineer making the appraisal. The engineer will ascertain the present condition of the property, and the results of his investigation as to the extent of depreciation may be checked and compared with the amount held in reserve to offset depreciation. The results of the accounting and engineering studies should furnish the commission valuable data for determining the extent to which the value of the property may have declined because of depreciation.

In many of the cases decided, the commission, instead of attempting to find by inspection of the property the existing depreciation, has accepted the amount of the depreciation reserve as the measure of existing depreciation, and has adopted such amount in making its valuation.

In a recent case, the New York Commission, in making a valuation, deducted the full amount of the depreciation reserve, stating: "These depreciation reserves represent the company's own estimate of the extent to which their own property has aged, the extent to which the liability of replacement has accrued, and the extent to which the property's power to continue service has been exhausted. The company should be bound by its own contention and its own practices. The amount of the depreciation reserve has not been held in a separate fund, but it has been invested in telephone plant (rec., pp. 535-536) and embraced in property which has been here evaluated for the purpose of determining a rate base. The company thus has credit for all property it uses in the public service and there is simply deducted the amount of its own estimate of the accrued depreciation in its plant, which is the equivalent of its reserves maintained by collections from subscribers. We believe the decisions of the courts are in accordance with this view."

Public Utilities generally object to the deduction of theoretical depreciation based on the so-called straight-line method of computation, which was the method used by the telephone company involved in the case referred to above. It is contended that such deductions deprive the company of property, or the use of property which belongs to the company, and that such action is unjust.

It is not the purpose here to argue the matter as to which course should be taken, or to fully present the reasons on each side. So far as a presentation of the matter from the accounting standpoint in a rate proceeding is concerned, it is apparent that the record of the depreciation reserve, the use made of the moneys belonging to the reserve and the extent to which replacements are charged to operating expenses, form a most important line of evidence, which should be fully presented to the commission or the court considering the case.

Corporate History. - In the development of the public utilities of this country there have been many consolidations, reorganizations, leases, purchases, and sales of established utilities. An accounting report to a commission, or for the use of a commission in a rate case, should show the corporate history of each company that has held the property. Such a report should give the date of organization of each corporation, the property it controlled or acquired, the cost of the property, use or disposition of the property, the amount and kinds of stocks and bonds issued, the money or property received as consideration for stocks and bonds, the disposition of such moneys or property, the funds procured from other sources, and a statement of annual revenues, expenses, and profits. In short, everything of importance relative to the financial history should be shown.

Cost of Structural Units. - In addition to statements showing all utility property classified in accordance with the primary accounts of the classification of plant and equipment accounts, the cost of major structures should be shown by structural units, such, for instance, as cost of power house, gas holder, water tank, or reservoir.

In case the records are so incomplete that the original cost to date of all the property cannot be ascertained, it is of even greater importance that the cost of structural units be shown as far as possible. This information is the best guide obtainable for the use of the engineer, who, in the absence of data obtained by the accountant showing complete original cost, must build up from inventory, as of the date of valuation, an estimate of original cost. The amount of work along these lines will depend greatly upon circumstances in particular cases and upon the extent that information of this character will assist the engineer making the appraisal.

Insufficient Records. - In some cases, because of loss of records, it is impossible to ascertain the original cost of all the property of the corporations. Instead of ascertaining the cost of individual pieces of property, the accountant endeavors to determine the investment by ascertaining the sources from which the money used was obtained and the amount thereof.

If securities were issued in exchange for property, particulars of the transactions should be given. If appropriations from income or surplus have been made for additions and betterments, the extent of such reinvestment of earnings should be disclosed. The amount and the source of all moneys that have been expended for property should be shown. If the accountant is able to secure this information, the total amount that has been expended in acquiring and building up the utility property will have been ascertained. This is not necessarily the original cost to date of property in service, because some of the property originally installed may be no longer in use. Therefore, deduction for retirements must be made in order that the original cost of property still in use may be found.

The next problem is to determine what items of property have been retired but not written off. If the records have been so badly kept that they do not show retirements, they are apt to be too incomplete to readily disclose what property has been abandoned or retired. However, it is possible in many instances by a close study of the records to discover at least the major items. One method by which they may be traced is to note the new installations and ascertain whether they are additions or replacements. If a replacement, frequently the records will yield information as to the cost of the original unit. It may, of course, be necessary to search the records for a considerable period for the purpose of identify-ing the original entry. In the case of property retired and not replaced, other means of identification may be available.

To a considerable extent the success of the accountant in establishing the necessary evidence of cost will depend upon his resourcefulness and experience in connection with the utility business. In examining the entries of the cost of units installed many years previously, the experienced accountant will note those units that are of a type no longer in use, or will recognize buildings and other structures the use of which has been discontinued.

Frequently the minutes of the directors' meetings will be of service in obtaining information as to important changes. In the majority of cases where records exist, even tho details be scant, it is possible to trace the more important units of property. If nothing more definite can be determined, it should at least be possible to determine the maximum amount of investment that has been made in the property. Even this serves as a check on other estimates.

Gifts, Grants, and Donations. - Pieces of property are sometimes acquired by a public utility without outlay in cash or its equivalent. These may be given by public authority or by private individuals. In some cases the company acquires title to the property, while in others it does not. Occasionally the right is granted for the use of the property for utility purposes only. This right may be for as long a period as the property is used for the specified purposes, or may be for a definite period, but it does not become the property of the company, and the right of use is conditioned upon the continuance of its use for the specified purpose.

A common source of argument arising in connection with valuations for rate making is the matter of the dividing line between facilities furnished by the company and those provided by the consumer. Frequently in the valuation of gas or water utilities it develops that during all or part of the company's history the consumer paid for the service pipe extending from the main located in the street to his property line, and in some cases for the meter. Considerable argument develops at public hearings before commissions as to who actually paid for these things, at whose cost they have been maintained, and whether the company should be allowed a rate of return upon their cost or fair value.

Another question of recent origin relates to rural electric transmission and distribution lines, where residents of rural communities build the line and transfer it to a utility company without payment for its cost, the company accepting it under an agreement whereby the company assumes the maintenance of the line and renders service to the builders.

It is the accountant's business to produce the facts so far as records at his service will permit, so that the engineers and lawyers may present their theories and arguments with respect to such facts, and commissions and courts may decide the case with a complete record before them.

Property Not Used and Useful. - In valuation for rate-making purposes, state commissions have been practically unanimous in excluding property not "used or useful" in rendering public-utility service. This rule, however, is not usually applied where property is held for future use if there is reasonable expectation that it will be actually used and useful in future operations. Neither is this rule always applied in the case of property, the use of which has unexpectedly terminated and before reasonable opportunity is afforded to write off the loss against earnings. It has frequently been held that investment in land, buildings, or other property in excess of the needs of the present or immediate future should not be included in the valuation on which present consumers are required to pay a return. In many cases, however, it is a wise managerial policy and in the interest of the consumers for the company to acquire land suitably located for its extensions before the demand for such land for other uses results in an increase in its market value.

Where property not in use is carried on the books(whether held for future use or to be disposed of and written off), it is not for the accountant to determine its present value or to say whether any value for such assets should or should not be included in the valuation. If he presents to the commission all available information as to the cost of such items, date acquired, how long used, when their use was discontinued, and available facts bearing on their probable future usefulness, he has done all that can be expected of him in this matter, as far as valuation is concerned.

Property Owned but Not Used. - Property owned by the company but leased to others requires special consideration in a rate case. The value of such property may be included or may be excluded in the valuation for rate-making purposes. If included, the income received in the form of rental for the use of the property must be considered as part of the company's income, the same as tho earned from its own operations. If such property is excluded from the valuation, the rentals must be excluded from the income, so far as the rate case is concerned.

The accountant's exhibits should show the terms and conditions of the lease under which the property is used and should particularly show the amount of the rentals and the original cost of the property.

Care must also be used, in analyzing the operating expenses, as to any expense incident to such property. If income is excluded for rate purposes, consistency requires that the expense in connection with it be fully determined and applied against such income and not included in the regular operating-expense statement.

The foregoing suggestions apply to the preparation of statements and exhibits and their use in a rate proceeding. It is not to be understood that the books themselves are to be adjusted and set up exactly to correspond with the manner in which a commission may view a particular case. As a matter of bookkeeping, however, the books and records should be kept so far as practicable so that data can be readily obtained for consideration of all aspects of the situation presented where property is operated under lease.

Property Used but Not Owned. - Property used by the company in its own operations under lease from others presents a situation involving many of the same principles and methods of treatment as discussed under "property owned but not used." The value of such property may be added to the valuation of company-owned property and the rentals paid for its use excluded from the cost of operation; or it may be omitted from the valuation and the rentals included in operating cost. Of course, rental is in the nature of a return on the investment in the rented property. If the value of the rented property is included in the total value for the company operating it, the return allowed on the entire property value includes a return to the operating company on the rented property. Out of this return the operating company will pay its rentals, interest, and dividends. All three items represent return on investment in used and useful property.

If the leased property is not included in the valuation of the operating company, the rentals paid must be considered as an operating cost, for if not so considered, the company would receive no return for the use of the property, not even a return for the actual rental paid.

The utility company, if it has succeeded in making a good bargain in renting a property at a low level, is likely to claim a rate as high as allowed for its owned property. The company will claim that on the ground that as it is "used and useful in the public service," the property is just as valuable for that purpose as tho owned by the company, and that the company is entitled, because of its foresight and business sagacity in making the bargain, and perhaps because of the risks of operation which it assumes, to reap the benefit of the difference between the low rental and the "fair return" allowed for the use of its property for public-utility purposes.

Somewhat closely related to the subject of "leased property" is the matter of improvements on leased property. Where improvements are made on property held under lease, if the full benefit of such improvements will not be obtained, due to the fact that the improvements will outlast the period covered by the lease and will revert to the lessor, a question arises as to the value to be assigned to such improvements. A complete record of this class of property, together with all pertinent facts concerning it, should be secured.

Property jointly owned presents another subject for consideration as to the valuation to be placed thereon for rate-making purposes. It is important that the extent of ownership and other matters of interest relating to the use of such property be fully disclosed. The company's records with reference to this class of property should be carefully kept, as it is a matter in which there is considerable opportunity for misunderstanding unless adequate records are maintained.

Property Acquired from Income or Surplus. - There appears to have been some confusion in certain decisions of courts and commissions as to whether property paid for out of surplus earnings should be included in valuations for rate making. Surplus earned under lawful rates is unquestionably the property of the corporation. It is available for distribution as dividends if the directors desire. If they choose to reinvest the money in additions and betterments, the stockholders do not thereby forfeit their property or their right to its use.

The argument that the stockholders should not receive a return on the property so acquired, because the "public" has paid for it, could be applied with as much justification to all dividends. All dividends are paid for by the "public" out of revenue from rates. When the rates collected are the lawful rates, it is the stockholder's right to retain them and receive his profit in cash dividends or to reinvest it in additional property as he may choose. The accountant, however, should not only know the source of funds employed in the business and the profits accruing from their use, but should also understand the legal and economic status of such funds in order that he may the more effectively protect the interests committed to his care, and may aid in promoting sound public policy in places where the issues have become somewhat befogged.

Going Value. - "Going Value" or "Going Concern Value" represents an element of value that has been recognized by commissions and courts in varying degrees. The term "going value" is not an accounting term, and the books will reveal no figures definitely representing this element of value. The accountant is concerned with it because, in whatever light it is considered, the financial history of the company and various data drawn from the records of the business will supply the basis for a reasonable judgment as to the value to be assigned to this element.

There is no generally accepted rule or formula for determining the amount of going value. The most important decisions usually express the judgment of the commissioners or courts, and the amount determined upon is perhaps often the product of the application of varying economic views of different individuals to the circumstances in the particular case under review.

In some cases, attempts have been made to determine the amount of going value by mathematical calculations. Probably the rule most nearly approaching mathematical precision is one used by the New York Court of Appeals (in People v. Will, 104 N. E. 912), in which Justice Miller, defining going value and stating a method for its determination, said:

> "I define 'going value' for rate purposes, as involved in this case, to be the amount equal to the deficiency of net earnings below a fair return on the actual investment due solely to the time and expenditures reasonably necessary and proper to the development of the business and property to its present stage and not comprised in the valuation of the physical property.
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> "Obviously, the most satisfactory method of determining 'going value' is to show the actual experience of the company, the original investment, its earnings from the start, the time actually required and expenses incurred in building up the business, all expenditures not reflected by the present condition of the physical property, the extent to which bad management or other causes prevented or depleted earnings, and any other facts bearing on the question, keeping in mind that the ultimate fact to be determined is not the amount of expenditures but the deficiency in fair return to the investors due to the causes under consideration."

The method here applied is generally known as the "Wisconsin method," frequently referred to as "accrued-deficit method. A more definite idea of the accounting procedure involved in this method may be had from the following quotation from a report of the Wisconsin Railroad Commission in 1910:

> "The plant was charged with the cost of the plant at the beginning of the first year, with the new extensions, interest on the investment, depreciation of the plant, and the expenses of operation during the first year. It was next credited with the total gross earnings during the year. The balance between these debits and credits was regarded as the net value of the plant at the end of the year. This balance was then carried forward to the beginning of the second year, and with the extensions, interest, depreciation, and operating expenses for this year charged up against the plant in the same manner as for the first year. The credits to the plant for the second year, the same as for the first, consisted of the gross earnings; and the balance was regarded as the net value of the plant at the end of the second year. These operations were performed for each year of the life of the plant, the balance at the end of the last regarded as the value of the plant on the earnings basis in question at the end of the period. Computations of this character must of necessity show the value of a plant at the end of each year on any given earning basis."

Many of the factors named in connection with the foregoing formula are ascertainable from the records. However, the language, "the extent to which bad management or other causes prevented or depleted earnings and any other factors bearing on the question," introduces elements which it may be difficult to express with mathematical accuracy. It would, for instance, ordinarily be difficult to determine the exact extent of the effect of bad management on earnings. This question would usually involve the exercise of judgment as to what financial results of operation would have been secured under a management that was not "bad," before the effect of bad management in each year of the company's past history could be measured in financial terms.

One point raised against this formula is that it does not work both ways; that it permits an increase in rate making value to the extent that past earnings have failed to yield a fair return, but that it does not reduce the value of excessive earnings that have been received. The objection is also made that the less value a property has as a revenue producer, the higher its going value would be; that errors of judgment in the location, engineering blunders in construction, and inefficient management in operation may be improperly rewarded.

In numerous cases the method above described has been rejected, and an amount representing going value determined upon some other basis has been included in the valuation. In many cases the basis upon which the amount is determined is not explained. There are also numerous cases in which it is stated that the property has been valued as a going concern and proper allowance made for going value without separating it from the other elements of value and stating the specific amount thereof.

The so-called accrued-deficit theory above discussed was rejected by the U. S. Supreme Court in a case where the question was whether going value determined on this basis should be included in a valuation for the purpose of determining whether a rate is confiscatory. (Galveston Electric Company v. City of Galveston, 258 U. S. 388, 66 L. ed. 382; Sup. Ct. 357, April 10, 1922). The Court stated:

"The going-concern value for which the master makes allowance is the cost of developing the operating railway system into a financially successful concern. The only evidence offered or relied upon to support his findings is a capitalization of the net balance of alleged past deficits in accordance with what was said to be the Wisconsin rule. * * *

"If the rule were that a prescribed rate is to be held confiscatory in case net earnings are not sufficient to yield 8 per cent on the amount prudently invested in the business, there might be propriety in counting as part of the investment such amount, if any, as was necessarily expended at the start in overcoming initial difficulties incident to operation and in securing patronage. But no evidence of any such expenditure was introduced; and the claim of the company does not proceed upon that basis. * * *

"The fact that a utility may reach financial success only in time or not at all is a reason for allowing a liberal return on the money invested in the enterprise; but it does not make past losses an element to be considered in deciding what the base value is and whether the rate is confiscatory. A company which has failed to secure from year to year sufficient earnings to keep the investment unimpaired and to pay a fair return, whether its failure was the result of imprudence in engaging in the enterprise, or of errors in management, or of omission to exact proper prices for its output, cannot erect out of past deficits a legal basis for holding confiscatory for the future, rates which would, on the basis of present reproduction value, otherwise be compensatory. * * *

"Past losses obviously do not tend to prove present values. The fact that a sometime losing business becomes profitable eventually, thru growth of the community or more efficient management, tends to prove merely that the adventure was not wholly misconceived. It is doubtless true, as the master indicated, that a prospective purchaser of the Galveston system would be willing to pay more for it with a record of annual losses overcome than he would if the losses had continued. But would not the property be at least as valuable if the past had presented a record of continuous successes? And shall the base value be deemed less in law if there was no development cost, because success was instant and continuous. Or, if the success had been so great that, besides paying an annual return at the rate of 8 per cent, a large surplus had been accumulated, could the city insist that the base value be reduced by the amount of the surplus?

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"Going-concern value and development cost, in the sense in which the master used these terms, are not to be included in the base value for the purpose of determining whether a rate is confiscatory."

The "reproduction value" used above is explained in a preceding paragraph of the decision as "estimated undepreciated cost of reproduction on the historical basis; that is, what the property ought to have cost on the basis of prices prevailing at the time the system and its various units were constructed."

Summing up the points touched upon, we find that going value is now generally recognized as an element to be included (when supported by proper evidence) in the valuation of public utilities for rate-making purposes; that its nature and the processes by which the amount is to be determined are matters upon which there still exists great contrariety of opinion; that it is generally regarded as not susceptible of exact mathematical computation; that its determination is largely a matter of judgment; and that the financial history of the company affords a basis for its consideration.

Valuation of Working Capital. - The term "working capital" is applied to an element of value for which allowance is made in valuations for rate-making purposes, and, like "going value," is not an accounting term. The determination of the allowance for working capital, however, is reached directly from the information exhibited by the accounts, particularly those representing current assets, current liabilities, and operating expenses.

The justification for allowing an amount for working capital as a part of the total valuation for rate-making purposes arises from the necessity for the production and delivery of service for a period before the receipts from its sale are available. A utility company must make an outlay for materials and supplies to operate and maintain its plant and equipment, must pay its employees and provide for insurance and other items. The length of time that these expenditures must be made before revenues are available varies to a considerable extent with respect to different classes of materials, and with reference to labor depends upon the frequency with which labor is paid. Insurance usually is paid for at least a year in advance. A sufficient supply of all materials must be kept on hand to guard against delays which might be incurred in purchase or transportation, and therefore considerable sums must be continually tied up for these purposes.

The company, of course, is reimbursed from operating receipts from time to time, but the funds for this purpose originally were provided from capital. The amount of capital employed for this purpose cannot be withdrawn from the business so long as operations continue. It is, therefore, just as fully dedicated to the public service as are the so-called fixed-capital assets.

No definite rule capable of wide application can be laid down as to the method of computing the amount of working capital. The circumstances of each case must be considered separately. A common practice is to make an allowance equal to the operating expenses for one or two months, or other specified period, depending on the circumstances existing in each case.

Another method frequently employed is to compare the amounts in use at different periods by reference to the various current-asset and current-liability accounts, and from these determine an average or normal amount. Usually accounts payable are considered as an offset to materials and supplies to the extent that they represent purchases of materials included in current assets. This is done on the theory that working capital to the extent of such accounts payable does not represent funds provided by the company.

If the latter method is used, great care should be exercised in comparing current-asset and current-liability accounts, because the relation of these accounts is not a reliable index to the amount of working capital needed. Some companies carry a relatively large amount of accounts payable, while others finance operations by temporary loans or supply themselves with working capital from the issue of securities. Some of the cash on hand, or the materials and supplies, may have been acquired from the sale of securities for construction purposes. Altho such cash and materials are considered current assets, they are not working capital in the sense here used. Furthermore, there is a considerable variation as between different dates in the amount of current assets and liabilities, which fluctuate without regard to the working capital in use. The revenue-billing dates may contribute in some measure to these fluctuations. Where meter reading is not continuous, but all meters are read at about the same time, just before the end of the month (a practice followed by small companies), the accounts receivable on the last day of the month will be abnormally large. The amount of cash on hand is also abnormal at certain times during the year, when there are accumulations of funds to pay dividends, interest, or principal of loans, or for other purposes.

The amount of working capital is a matter involving the use of a reasonable business judgment, based primarily on the facts disclosed by the books. With an understanding of the nature of the problem of determining the amount of working capital allowable as an element of valuation of the property, the accountant should be able to present the matter intelligently, so that it may receive the consideration to which it is entitled.

Apportionment of Property between Different Departments. - Where a company operates two or more classes of utilities, such as electric, gas, and water, there is usually a considerable amount of property, particularly land, buildings, and stores, and garage equipment, which cannot be charged in its entirety to any one department. The commissioners' classification of accounts provides that fixed-capital accounts should be so subdivided as to distinguish clearly between general capital and departmental capital. It is intended that the records be so kept as to enable the corporation to report separately the fixed capital devoted to each particular department, or jointly to any specific group of departments.

Altho the accounting along these lines may be carried out as carefully as possible, it is usually necessary in a rate proceeding that a special study be made of the use being made of the property by different departments. After property is recorded on the books, the changes that take place in the character of operation and in relative volume of business create differences in the extent of the use, and it is not practicable to have the books reveal the effects of these changing conditions.

No fixed rule can be laid down as to the basis on which apportionment of jointly used property should be made. In determining the extent of the use, it is sometimes proposed to use the ratios of gross income of each department to total gross income. This method, however, is faulty when used in a rate proceeding wherein the question at issue is what the gross income from each department ought to be. This method was condemned by the Supreme Court of the United States in its opinion, rendered by Justice Hughes, in the Minnesota rate cases (230 U. S. 461), in which it was said:

> "When rates are in controversy, it would seem to be necessary to find a basis for a division of the total value of the property independently of revenue, and this must be found in the use that is made of the property; that is, there should be assigned to each business that proportion of the total value of the property which will correspond to the extent of its employment in that business."

Rate of Return. - The determination of the rate of return on the property valuation involves the exercise of an enlightened business judgment on the part of the commissioners or others whose duty it is to determine the amount of percentage of return on the valuation. A fairly comprehensive statement of the matters to be considered is contained in a recent decision of the United States Supreme Court. A reading of this decision will give a very good idea of the data that should be presented to a commission to enable it properly to consider the matter. The decision referred to is in Bluefield Water Works and Improvement Company v. Public Service Commission of West Virginia, decided June 11, 1923. (P. U. R. 1923 D, 11, 43 Sup. Ct. Rep. 675) It quotes from several of the court's earlier decisions, the latest decision being included in the following excerpt:

> "The company contends that the rate of return is too low and confiscatory. What annual rate will constitute just compensation depends upon many circumstances, and must be determined by the exercise of a fair and enlightened judgment, having regard to all relevant facts. A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties; but it has no constitutional right to profits such as are realized or anticipated in highly profitable enterprises or speculative ventures. The return should be reasonably sufficient to assure confidence in the financial soundess of the utility, and should be adequate, under efficient and economical management, to maintain and support its credit and enable it to raise the money necessary for the proper discharge of its public duties. A rate of return may be reasonable at one time and become too high or too low by changes affecting opportunities for investment, the money market, and business conditions generally.
>
> * * * * * * * * * * *
>
> "In January, 1923, in City of Minneapolis v. Rand, the Circuit Court of Appeals of the Eighth Circuit (285 Fed. 818, 830) sustained, as against the attack of the city on the ground that it was excessive, 7½ per cent, found by a special master and approved by the District Court as a fair and reasonable return on the capital investment - the value of the property.
>
> "Investors take into account the result of past operations, especially in recent years, when determining the terms upon which they will invest in such an undertaking. Low, uncertain, or irregular income makes for low prices for the securities of the utility and higher rates of interest to be demanded by investors. The fact that the company may not insist as a matter of constitutional right that past losses be made up by rates to be applied in the present and future, tends to weaken credit, and the fact that the utility is protected against being compelled to serve for confiscatory rates tends

> to support it. In this case the record shows that the rate of return has been low thru a long period up to the time of the inquiry by the commission here involved. * * * Under the facts and circumstances indicated by the record, we think that a rate of return of 6 per cent upon the value of the property is substantially too low to constitute just compensation for the use of the property employed to render the service."

It should be noted that the language of the Supreme Court relates to cases in which the question before the court was whether a certain return would be so low as to be confiscatory and not a question as to whether it would constitute a just and reasonable rate. There is a difference between these two questions. The court, however, has discussed the matter to some extent from the standpoint of a just and reasonable rate. The problem before the state commission is not to find a rate that will barely escape the complaint that it is confiscatory, but rather a rate that is reasonable. A distinction between a nonconfiscatory rate and a reasonable rate is recognized and emphasis laid upon the conditions pointing to a reasonable rate in a recent decision of the Illinois Commerce Commission.

> "At the outset there is a variance in the decisions of the courts, because in some decisions the consideration of the court is a reasonable return upon the value of the property of a corporation, used and useful in the public service, while in other cases the consideration of the court is directed toward the question of whether or not the value fixed amounts to a confiscation of the property of the corporation in question. Certain fundamental economic principles should always be considered in the fixing of a fair value. The interests of the corporation are practically coincident with the interests of the public. The valuation of the company should be such that capital seeking investment would flow in sufficient amount into the securities of the company that it might make, without any considerable effort, necessary investments to insure public service."

One matter which the Supreme Court of the United States has indicated as a matter to be considered in connection with the rate of return is income tax assessed by the Federal Government. For a number of years some of the state commissions had followed the practice of excluding from the operating expenses Federal income taxes, while other state commissions had permitted their inclusion.

Discussing the inclusion of such taxes in the operating expenses, the Supreme Court (in Galveston Electric Company v. City of Galveston, 258 U.S. 388; 66 L ed. 382, Sup. Ct. 351; April 10, 1922) said:

> "In calculating whether the 5-cent fare will yield a proper return, it is necessary to deduct from gross revenue the expenses and charges; and all taxes which would be payable if a fair return were earned are appropriate deductions. There is no difference in this respect between state and Federal taxes, or between income taxes and others. But the fact that it is the Federal corporate income tax for which deduction is made must be taken into consideration in determining what rate of return shall be deemed fair. For, under Section 216, the stockholder does not include in the income on which the normal Federal tax is payable dividends received from the corporation. This tax exemption is, therefore, in effect, part of the return on the investment."

The Interstate Commerce Commission, in an order establishing certain railroad rates July 1, 1922, wherein it fixed a rate of return for the railroads at 5.75 per cent, referred to the Galveston decision of the Supreme Court and stated:

> "In our view, railway corporations should, like other corporations, pay their Federal income taxes out of the income, rather than to collect it, in effect, from the public in the form of transportation charges adjusted to enable it to retain the designated fair return over and above the tax. We may observe that a fair return of 5.75 per cent, representing an aggregate annual net railway operating income arrived at after deducting, among other things, the Federal income tax on a return of 6 per cent, would be approximately the equivalent of a fair return of 6 per cent, out of which the Federal income tax was payable."

It appears from the above quotation that the Interstate Commerce Commission considered that the effect of the income taxes payable by railroads would be equivalent to about one quarter of one per cent on the valuation of railroad property. The effect that should be given to this element in different cases would vary according to circumstances.

It may be observed that, in the view of many public-utility operators and others, Federal income taxes are a charge against income which the company can not avoid, and that it should not be treated differently from any other operating cost in determining the income to which the company is entitled. The Supreme Court, however, as shown in the above quotation, takes the view that such taxes should be considered and the amount of income allowed to the company diminished accordingly. The court's decision, of course, settles the law on this point.

Cost of Operation. - The cost of operation as related to a rate case involves:

1. The total cost of operation properly allowable as a deduction from gross revenues.
2. The separate statement of costs with reference to the use of different property and facilities, so that the service to all classes of consumers may be determined equitably.

The Determination of Cost of Operation. - A commission in a rate case is concerned, not only with ascertaining the amount of actual operating expenses for recent periods, but also in ascertaining whether they are reasonable and necessary expenses. The efficiency of operation and its bearing on operating cost is a subject of deep interest, and this involves the question of whether there is extravagance or waste in the conduct of the business. As elsewhere noted, commissions have in some cases definitely stated in their decisions that the liberality of the rate of return allowed was influenced by the character of the management, as reflected in efficiency of operation. Commissions also sometimes reject specific items, or portions of items, of expense, on the ground that they are the result of gross negligence or inefficiency. The salaries paid officers are noted, and occasionally, where the commission considers them excessive, the full amount is not allowed in operating expenses on which rates are based.

Another matter usually given attention is whether the expenses indicated are normal, considering the prevailing prices of labor and material, the volume and kind of business transacted, and any special conditions which affect operating cost. The regulation of rates is a prospective, rather than a retrospective, action. Operating expenses of past periods are examined for the purpose of forecasting the reasonable and necessary expense that must be incurred in operating during a future period. The problem is to obtain, from a study of the operations of periods in the recent past, a reliable index to future expense.

Such a study is especially important with reference to maintenance expense, which occurs more or less in cycles. The maintenance expense of a given year may be abnormally low or high. If the total expense for a period showing abnormal expense were taken as representing the expense for a period in the future, it might be very misleading. If much above normal, it might result in rates for the future being fixed unreasonably high. If, on the other hand, the expense shown were abnormally low, of course its use in forecasting the future expense would result in fixing rates below a fair and reasonable figure.

Prospective changes in expenses must be very carefully noted. This relates to the effect of changes in labor and material costs which are soon to become effective, but the effect of which does not appear in the expenses of past periods. In this connection should also be considered and clearly explained the effect of changes already made where the full effect is not disclosed by the expense statements of the last year. For instance, the cost of materials or labor may change at various times during a year. When this happens, of course, the actual total expenses for the year will not be an index to the expenses of the next year until the figures are adjusted to show what the effect would have been if the costs in effect during the last part of the year had been in effect thruout the year.

If prices of labor, fuel, or other materials involving large amounts changed on December 1, it would not be proper to consider that the total expenses for the year indicated the cost of operation during the coming year. Nor would it be considered that twelve times the total for December would represent the total for the coming year. The amount of labor and material used vary somewhat from month to month, and the only safe way is to determine what the present prices, or those that will be effective, applied to the amounts used during a year, based on the present or anticipated requirements, will indicate as the cost of operation.

If an auditor outside the company's organization is making the examination and preparing a report in a rate case, he will, of course, examine the distribution of charges to operation and to capital accounts, for the purpose of ascertaining whether or not the accounts are correctly stated.

The Cost of Different Classes of Service. - After the commission has made the valuation of property, or rate base including going-concern value, and working capital, and has determined the allowance for operating expenses, the rate of return, and the amount of net income required, and has determined the amount of gross income which should be earned, it must then determine the rates which will produce this gross income and divide the burden as justly as possible between the different classes of consumers.

At this point many puzzling questions may be encountered as to what constitutes an equitable division of this burden. Approaching the question as it must be approached with a view to a just division, it would appear that the consumer should be required to pay in direct proportion to the cost to serve him. But conditions are encountered which require the consideration of some factors other than the cost of service. However, the cost to serve various classes of consumers is certainly a matter to be given most careful consideration in whatever method of procedure is followed. The cost of serving a consumer is usually divided into three elements, as follows:

1. Customer cost. This includes such cost as reading meters, making and collecting bills, keeping accounts, and all such costs as are independent of the extent of use which the consumer makes of the service.
2. Manufacturing cost. This includes the cost of manufacturing or producing and delivering the output or service.
3. Investment cost. This includes the cost of capital, termed "return on investment."

The data necessary to a consideration of these three divisions of cost, as well as many subdivisions, may ordinarily be obtained without great difficulty from statements exhibiting the accounts when the accounts have been kept properly and with sufficient detail. However, before such statements are prepared from the books, it is necessary that a careful examination be made so as to make sure that all costs are properly recorded, and that where apportionment of certain costs is required, it is made on a proper basis. Rate studies frequently develop new ideas involving changes in the character of rates for some classes of service or unusual conditions necessitating a special analysis of certain costs.

It is impossible to determine with absolute accuracy the cost of performing every class of service. What is required, therefore, in determining costs to be used in the regulation of rates is as near an approach as possible to an absolutely correct statement of the cost of performing the service and of the value of property used and useful in performing the service.

Each class of service must be self-sustaining. Where various classes of service are performed, one class can not be segregated and rates applied thereto which yield revenues greater or less than justified by the reasonable and necessary cost of the service, on the ground that, averaging the entire business of the company, the rates produce a reasonable return. To deny adequate rates on one class of service would mean a denial of an adequate return on the entire business, or else would mean that excessive rates would be imposed on certain classes of consumers to make up the deficiency. For instance, it would be unjust to make the users of water or gas bear some of the cost of electric service or those consuming energy for lighting to carry the burden of consumers using electricity for power purposes.

There are, however, cases in which it is to the advantage of all consumers that some particularly large consumer receive rates lower than consistent with the actual cost of service. This is due largely to competitive conditions. For instance, a factory may purchase electric energy from the utility for power purposes, or it may produce its own power by the use of a steam power plant, gasoline, or other means. In order to obtain the business, the electric utility must make a rate which will induce the factory to buy electrical energy. By reason of the larger output thus secured, enabling the utility to reduce the cost per unit, the small consumer may be able to obtain service at a lower rate than would be possible if the service to the factory were not rendered.

In the apportionment of costs between different utilities, as where a company operates electric and gas utilities or other combinations or between different departments of the same utility, there arise many questions as to the basis of apportionment.

Investigation has frequently disclosed that the individual customers of a water utility have been paying water rates out of proportion to the charges made against the municipality for fire-protection service. In such cases the principal item of cost which has been improperly charged to the individual is the investment cost. In order to give proper fire protection the mains must be large enough to carry sufficient water for fire purposes to any part of the city, and where the high-pressure system is used the entire plant must be built of materials of sufficient strength to stand the pressure. Two of the methods used for apportioning the investment cost between fire-protection service and the ordinary consumers service are, (1) surplus-capacity method, and (2) comparative-plant method. These are very similar to the two methods used for apportioning steam-production cost, as explained herein.

In determining the proportion of the investment cost in an electric utility that is chargeable to a certain consumer or class of consumers, one important consideration is the maximum demand of that consumer or class of consumers and whether his greatest demand or peak load is at the same time as the peak load of the generating station. Whether additional plant capacity must be installed to permit taking on the additional load of a new power consumer or group of consumers often depends on the time when the service is to be used.

The utility must provide equipment of sufficient capacity to take care of the peak load, even tho this load is only connected for an hour or two in the year. Lower rates are usually made to consumers who limit the time of their use of the service to such hours as the generating station has a comparatively small load.

Generally, great weight should be given to the extent of use by each department, or the extent of benefit derived by each department. There are, however, many factors which may require consideration. Indeed, if it were granted that the extent of use or benefit realized by a given department should determine the charge, there are some mooted questions as to how the use or benefit is to be determined. For instance, a question on which expert engineers, accountants, utility commissions, and courts have never reached any substantial agreement is how the cost of steam should be apportioned between an electric utility and a central-station heating utility supplied with steam from the same boilers. Some of the methods used by commissions in the apportionment of cost of steam will now be explained briefly.

Apportionment of Steam-Production Cost. - Some important cases requiring an apportionment of such costs involve an allocation of cost between an electric utility and a steam-heating utility where a company operates a central-station heating plant in connection with the electric utility, using for heating purposes steam from the boilers supplying steam to the electric utility.

The bases of allocation frequently used are -

1. Excess cost basis.
2. Comparative-plant or proportional-share basis.

Commissions have in some cases adopted the "excess-cost" basis of apportionment where the steam-heating business had grown up as a side issue, as compared with the electric utility. In using the excess-cost basis, the electric utility is charged with the amount which it would cost to operate the electric utility if heating service were not furnished. The amount of the cost in excess of the cost so determined is considered to be the cost of steam chargeable to the heating department.

The "comparative-plant" or "proportional-share" method involves the determination of the amount of coal that would be required by each utility if operating separately and comparing the totals, as so determined, with the amount of coal actually used at the existing plant. The difference between the two is, under this theory, a saving due to combined operation, and the amount saved is credited to the two utilities in the ratio of their requirements for independent operation. The resulting ratio is the basis used for apportioning the steam-generation expenses, other than for fuel, which are common to both utilities.

A determination of the proper apportionment of steam-production expenses of a combined plant serving electric and heating consumers cannot be made by the application of any hard and fast rule. Whatever formula is used must be applied with due regard to the conditions under which the plant under consideration was installed and is being operated. There is a considerable variation in the extent to which a heating utility may be operated on exhaust steam and the extent to which live steam is used. This and other factors make necessary a careful study of the operating conditions in each individual case.

The use of a method of apportionment which is a combination, or variation, of the "excess-cost" and the "proportional-share" methods as used by a certain company for apportioning cost of steam between its electric and heating utilities is illustrated below. As most of the computations are based upon the proportional amounts of the charges for fuel for steam, the method used to find the amounts of such charges will be explained first.

702.1-FUEL.

> During the heating season, assign fuel to electric utility on basis of the representative average pounds consumed per kilowatt hour delivered to switchboard during last previous nonheating season. In the present instance 5 lbs.
>
> Assign fuel to heating utility on basis of 1 lb. for each 8 lbs. of steam delivered to heating mains.
>
> Divide the total fuel used for steam upon basis of the percentage which each of the above two assignments bears to the sum of the two assignments.
>
> During the nonheating season, assign all fuel to electric utility.
>
> Illustration of computation to find amount of charge to each utility is as follows:

Kw.-hrs. delivered to switchboard during heating season, 11,706,247.

Pounds of steam delivered to heating mains during heating season, 495,326,500.

Tons of coal consumed during heating season, 59,023.33

Tons of coal consumed during nonheating season, 17,915.67.

Tons of coal consumed during year, 76,939, at an average cost per ton of $2.45; total amount, $188,500.55.

Computation:

Electric-

$$\frac{\text{11,706,247 kw.hrs.x 5 lbs. per kw.-hr.}}{\text{2,000 lbs. per ton}} - \text{29,266.07 tons}$$

Heating-

$$\frac{\text{495,326,500 lbs. steam} \div \text{8 lbs. steam per lb. coal}}{\text{2,000 lbs. per ton}} - \underline{\text{30,957.91 tons}}$$

Total estimated	60,223.98

Percentages of total: electric, 48.6%: heating, 51.4%.

As the actual coal consumed during the heating season was 59,023.33 tons, the apportionment, based upon the above percentages of total estimated coal, is as follows:

Electric-

48.6% of 59,023.33 tons =	28,685.34 tons, @ $2.45	$70,279.08
Nonheating season,	17,915.67 tons, @ $2.45	43,893.39
		$114,172.47

Heating-

51.4% of 59,023.33 tons =	30,337.99 tons @ $2.45	74,328.08
Total for both utilities		$188,500.55

701.2 - Boiler labor.

During the heating season apportion between electric and heating utilities in proportion to coal charged to each utility.

During the nonheating season assign all boiler operation labor to electric utility.

Electric-

48.6% of heating season total, $21,203.61	$10,304.95
Nonheating season total	9,415.50
Total charge to electric	$19,720.45

Heating-	
51.4% of heating season total, $21,203.61	10,898.66
Total for both utilities	$30,619.11

701.5 - Miscellaneous labor.

During both heating and nonheating seasons apportion between electric and heating utilities in proportion to coal charged to each utility during the heating season.

Electric -	
48.6% of total charged during year, $1,973.18	$ 958.97
Heating -	
51.4% of total charged during year, $1,973.18	1,014.21
Total for both utilities	$ 1,973.18

702.2 - Water.

During the heating season charge to electric utility amounts equal to the average cost per month during nonheating season. Charge balance to heating utility.

Electric-		
Nonheating season, 5 mos.	@ $345.50	$1,727.50
Heating season, 7 mos.	@ $345.50	2,418.50
Total charge to electric		$4,146.00
Heating -		
All of the total for year ($7,508.35) in excess of $4,146.00		3,362.35
		$7,508.35

702.31 - Lubricants.

A different basis of apportionment is used for this class of expense. During the heating season, October to May, inclusive, charge 80 per cent of the total cost to electric utility and 20 per cent to heating utility. Charge to electric utility total of such expense during the nonheating season, June to September, inclusive.

Electric -	
Heating season, 80% of total, $1,973.45	$1,578.76
Nonheating season total expense	1,130.30
Total charged to electric	$2,709.06
Heating -	
Heating season, 20% of total, $1,973.45	394.69
Nonheating season - no charge	- -
Total charged to heating	394.69
Total for both utilities	$3,103.75

702.32 - Production Supplies.

During the heating and nonheating seasons, apportion between electric and heating utilities in proportion to coal charged to each during the heating season.

Electric:-		
48.6% of total charged during the year,	$6,966.40	$3,385.67
Heating:-		
51.4% of total charged during the year,	$6.966.40	$3,580.73
Total for both utilities		$6,966.40

702.33 - Station expenses.

During the heating and nonheating seasons, apportion between electric and heating utilities in proportion to coal charged to each during the heating season.

Electric -		
48.6% of total charged during the year,	$3,483.31	$1,692.89
Heating -		
51.4% of total charged during the year,	$3,483.31	1,790.42
Total for both utilities		$3,483.31

703.1 - Maintenance of station buildings

During the heating and nonheating seasons, apportion between electric and heating utilities in proportion to coal charged to each during the heating season.

Electric -		
48.6% of total charged during the year,	$9,610.23 --	$4,670.57
Heating -		
51.4% of total charged during the year,	$9,610.23 --	$4,939.66
Total for both utilities		$9,610.23

703.21 - Maintenance of furnaces and boilers.

During the heating season, apportion between the electric and heating utilities in proportion to coal charged to each utility. During the nonheating season, apportion between the electric and heating utilities in proportion to coal charged to each utility during the previous calendar year.

Electric -		
Heating season, 48.6% of	$9,435.20	$4,585.51
Nonheating season 62.1% of	$10,331.49	6,415.86
Total charged to electric		$11,001.37
Heating -		
Heating season, 51.4% of	$9,435.20	$4,849.69
Nonheating season, 37.9% of	$10,331.49	3,915.63
Total charged to heating		$8,765.32
Total for both utilities		$19,766.69

703.22 - Maintenance of boiler apparatus.

During the heating season, apportion between the electric and heating utilities in proportion to coal charged to each utility. During the nonheating season, apportion between the electric and heating utilities in proportion to coal charged to each utility during the previous calendar year.

Electric -		
Heating season, 48.6% of	$7,327.48	$3,561.16
Nonheating season, 62.1% of	$8,917.26	5,537.62
Total charged to electric		$9,098.78
Heating -		
Heating season, 51.4% of	$7,327.48	$3,766.32
Nonheating season, 37.9% of	$8,917.26	$3,379.64
Total charged to heating		$7,145.96
Total charged to both utilities		$16,244.74

703.23 - Maintenance of steam accessories.

During the heating season, apportion between electric and heating utilities in proportion to coal charged to each utility. During the nonheating season, charge 50 per cent to the electric utility and 50 per cent to heating utility.

Electric -		
Heating season, 48.6% of	$ 546.25	$ 265.48
Nonheating season, 50% of	$1,062.42	531.21
Total charged to electric		$ 796.69
Heating -		
Heating season, 51.4% of	$ 546.25	$ 280.77
Nonheating season, 50% of	$1,062.42	531.21
Total charged to heating		$ 811.98
Total for both utilities		$1,608.67

703.04 - Maintenance of miscellaneous power-plant equipment.

During the heating and nonheating seasons, charge 50 per cent to electric utility and 50 per cent to heating utility.

Electric -	
50% of total charged during the year, $1,296.10	$ 648.05
Heating -	
50% of total charged during the year, $1,296.10	$ 648.05
Total for both utilities	$1,296.10

SUMMARY OF FOREGOING APPORTIONMENTS

		Basis of Apportionment		Amounts charged to	
		Heating Season	Nonheating Season	Electric Utility	Heating Utility
702.1	Fuel	Prop. Share	100% Electric	$114,172.47	$ 74,328.08
701.2	Boiler Labor	Prop. Share	100% Electric	19,720.45	10,898.66
701.5	Misc. Labor	Prop. Share	Same ratio as for Ht.Sea.	958.97	1,014.21
702.2	Water	Excess Cost	100% Electric	4,146.00	3,362.35
702.31	Lubricants	80%-Elec.20%Heat(a)	100% Electric	2,709.06	394.69
702.32	Prod.Supp.	Prop. Share	Same ratio as for Ht.Sea.	3,385.67	3,580.73
703.33	Station Exp.	" "	" " " " " "	1,692.89	1,790.42
703.1	Mtc. St. Bldgs.	" "	" " " " " "	4,670.57	4,939.66
703.21	Mtce. of Furnaces & Boilers	Prop. Share	Prop. Share	11,001.37	8,765.32
703.22	Mtce. of Boiler Apparatus	Prop. Share	Prop. Share	9,098.78	7,145.96
703.23	Mtce. of Steam Accessories	Prop. Share	50% to ea. utility(a)	796.69	811.98
703.4	Mtce. of Misc. Pr.Plt.Equipt.	50% to ea.Utility(a)	50% to ea. utility(a)	648.05	648.05
	Total Steam Generation Expense.			$173,000.97	$117,680.11

(a) For these accounts, neither of the two main methods of apportionment were used, but other bases were adopted which the company's officers considered as more equitable.

Apportionment of Supervision, General Expenses, and Taxes. - Where two or more classes of utilities, such as gas and electric or electric and water utilities, are operated by the same company and under the same general management, there are numerous classes of expense that must be allocated to the different departments.

Where the same superintendent has supervision over different departments, the expense of such supervision should be apportioned on an equitable basis. Frequently the most satisfactory allocation is determined by the time devoted to the different departments, altho, in special cases, there may be reasons for a variation from this rule.

Such items as general office supplies and expenses, stationery, rents, and similar items will have to be apportioned. Expenses such as cost of keeping consumers' ledger, which may be charged directly to specific departments, should be so charged. Such items, however, as general ledgers, which relate to all departments, rents, janitor service, and miscellaneous expenses, will have to be apportioned on some appropriate basis. Certain classes of expenditures may be divided on a basis of the relative number of consumers in the respective departments.

The allocation of taxes to different departments should be made with care. Where taxes are based upon net revenues or upon specific property values there should be no serious difficulty in dividing them between the different classes of utility service. There exists in the various state and Federal tax laws a considerable variety in the methods of making tax assessments, and no general rule can be stated which would furnish a guide to a correct allocation of taxes in all cases. An effort should be made, however, to select as a basis of allocation such factors as are most directly related to the base used for the tax assessment, whether it be gross revenues, net revenues, real estate and personal property, capital stock, or other basis.

Statistics of Production and Unit Cost. - In considering the costs of operation and related matters in a rate case, statements should be prepared showing the revenues and expenses, classified as to the revenues from various sources and the expenses pertaining to the various functions involved in production and distribution, and also the costs of making collections and of general administration of the business. It is essential that these statements be prepared in such form as will show comparative results of operation, so that the results for different periods may be compared.

These statistical statements should show the production, the sales, and the loss, loss being represented by unaccounted for electrical energy, gas, or water, as the case may be, in terms of units, kilowatt-hours, cubic feet, etc. Revenues should also be stated in terms of average revenue per unit sold, as "cents per kilowatt-hour," "cents per thousand cubic feet." All operating cost should also be figured per unit produced.

Figures 6,7, and 8 are presented to show the most essential items of information. These statements, however, are not constructed to give as much detail as is usually required. Further analysis of some of the items is usually necessary.

ELECTRICAL ENERGY GENERATED, PURCHASED, AND SOLD, AND OPERATING REVENUES AND EXPENSES IN CENTS PER KILOWATT HOUR SOLD

For the Year Ended December 31, 19___.

ENERGY PRODUCED AND DISTRIBUTED

		Kilowatt Hours
Kilowatt hours produced:		
Generated (less energy used in station auxiliaries)	$2,650,223,890	
Purchased (quantity for which respondent is billed)	17,337,221	
Exchange (received by respondent)	5,725,600	
Total available		2,573,286,711
Kilowatt hours distributed:		
Number of kilowatt hours sold (per summary below)	$2,265,255,523.	
Number of kilowatt hours used by company	11,148,333.	
Total distributed		2,276,403,856
Balance unaccounted for (transmission losses, etc.)		296,882,855
Per cent of kilowatt hours unaccounted for		11.54%

OPERATING REVENUES AND EXPENSES

Acct. No.		Number of Kw-hrs. sold	Amount	Cents per Kw-hr. Sold
	Operating Revenues:			
601-	Metered sales to general consumers:			
	(a) Residence lighting	244,111,458	$13,897,567.51	5.693¢
	(b) Commercial lighting	247,191,433	11,056,872.55	4.473
	(c) Commercial power	76,281,580	3,625,139.27	4.752
	(d) Combination light and power	734,114,907	12,009,117.40	1.636
	(e) Other sales - metered	662,443	38,191.60	5.765
602-	Flat-rate sales to general consumers:			
	(a) Residence lighting	---	---	---
	(b) Commercial lighting	2,220,415	90,427.07	4.073
	(c) Commercial power	13,344	360.00	2.698
603-	Railroad corporations	779,398,238	5,862,031.70	.752
604-	Other electrical corporations	99,469,682	910,083.99	.915
605-	Municipal street lighting	1,174,409	58,130.05	4.950
606-	Miscellaneous municipal sales	80,617,614	811,620.20	1.007
	Total sales of current	2,265,255,523	$48,359,541.34	2.135
	Miscellaneous Revenues:			
611-	Commissions on others' electric energy		---	---
612-	Rent for electric appliances		230,730.35	.010
613-	Rent for property used in operation		397,603.56	.017
614-	Merchandise and jobbing		42,583.11	.002
615-	Miscellaneous operating revenues		105,583.16	.005
	Total miscellaneous revenues		$776,500.18	.034
	Total operating revenues		$49,136,041.52	2.169

Acct. No.		Amount	Cents per KW.Hr. Produced
	Operating Expenses:		
701-705	- Steam power generation	$15,195,772.61	.596 (a)
706-708	- Hydro-Electric generation	----------	---
709-712	- Gas power generation	----------	---
713	- Electric energy from other sources	871,980.98	3.781 (b)
714	- Duplicate production charges - Cr.	----------	----
715	- Production expenses transferred - Cr.	----------	----
	Total production expenses	$ 16,067,753.59	.624
	Add for "used by company" and "balance unaccounted for"		Cents per Kw-hr. Sold .085 (c)
700	- Production expenses	$16,067,753.59	.709
720	- Transmission expenses	313,181.32	.014
730	- Distribution expenses	3,224,145.39	.142
750	- Utilization	1,887,171.95	.083
760	- Commercial expenses	1,900,480.28	.084
770	- New-business expenses	724,403.25	.032
780	- General and miscellaneous expenses	7,465,286.12	.330
402	- Total operating expenses	$31,583,421.90	1,394
	Net operating revenues	$17,552,619.62	.775

(a) Computed on number of kilowatt hours generated.

(b) Computed on number of kilowatt hours received from other sources.

(c) Figures above this item show costs per kilowatt hour of energy generated or obtained from other companies. The figures below it show the costs of transmission, distribution, etc. per kilowatt hour sold. It is shown in the preceding tabulation that of the total number of kilowatt hours produced or obtained from other sources, there were 11,148,333 used by the company and 296,882,855 unaccounted for, making a total of 308,031,188 kilowatt hours for which no revenue was received. The cost of producing this amount of energy (308,031,188 kilowatt hours) at .624 cents per kilowatt hour was $1,922,114.61. This amount is included in the total production cost, shown as $16,067,753.59. Dividing the cost of this non-revenue-producing energy, $1,922,114.61, by the number of kilowatt hours sold, 2,265,255,523. the cost amounts to approximately eighty-five thousandths of one cent (.085¢) per kilowatt hour sold. Adding this amount to the generation cost of .624¢ gives a cost of .709¢ for each revenue-producing kilowatt hour of energy.

Figure 6- Revenues and expenses per unit of electrical energy produced and distributed.

Explanation of Cost Statements. - The total amounts of operating revenues and expenses need not be shown in the same table as the other figures. They are shown in the foregoing tables for convenient reference in connection with the averages "cents per kw-hr." and "cents per thousand cubic feet."

The tables are intended to indicate the form in which comparative statistics may be set up. These forms provide for statistics as to quantities produced and sold, distribution losses, and operating revenues and expenses in cents per kw. hr. of electrical energy sold and per thousand cubic feet of gas sold, and per thousand gallons of water sold.

Such statistics are usually set up in tables columnar in form, one column for each month or year, as the case may be. In rate-case proceedings, figures should be included in the tables to show such statistics for the period under review, set up to show one year's figures in each column. In addition, it is frequently desirable that the current year and the year next proceeding, at least, be set up by months.

Should it be deemed desirable, the tables may be presented in greater detail by including each of the operating-expense accounts instead of only the accounts representing the total of each group of accounts.

In Figure 6 miscellaneous revenues are computed and shown in the last column in cents per kilowatt hour sold. These revenues do not, in fact, relate to sales of electrical energy. However, in dealing with certain subjects, such as rate making, it is desirable to consider all revenues expenses, and net revenues in terms of cents per kilowatt hour. It is, therefore, convenient to reduce the miscellaneous revenues to the same unit basis.

For the same reason the miscellaneous revenues in Figure 7 are stated as cents per thousand cubic feet of gas sold, and in Figure 8 as cents per thousand gallons of water sold. Owing to numerous "flat-rate" rates in effect for water utilities, it is only a matter of estimate as to the actual amount of water consumed. The city uses all the water necessary for fire protection at a "flat rate" per hydrant, regardless of the amount used. This makes it impossible to determine the rate of revenues or expenses per thousand gallons consumed, Therefore the next best unit is the number of gallons delivered to the mains to be used as a basis for dividing the revenues and expenses into comparable units.

Consumer Statistics. - When the valuation has been completed, the allowance for operating expenses found, the rate of return determined upon, and the required gross revenue is known and such division of costs made as are necessary with respect to different classes of service, so that the total gross revenue to be furnished by each class of service is determined, it then becomes necessary to construct rate schedules that will produce the gross revenue decided upon and will distribute among various individual consumers the total amount to be collected. A slight difference per unit in the selling price of electrical energy, gas, or water involves a considerable amount of gross revenue, and it is a somewhat complicated process to determine upon rates and combinations of rates that will produce, as nearly as can be calculated. the amount of gross revenue required from each class of

GAS MADE AND SOLD AND OPERATING REVENUES AND EXPENSES
PER THOUSAND CUBIC FEET OF GAS SOLD

During the year ended December 31, 19_____.

GAS PRODUCED AND DISTRIBUTED

Cubic feet of gas produced:	Quantity of Gas (Cubic Feet)
On hand December 31 (beginning of year)	54,985,000
Made during the year	16,169,836,000
Purchased during the year	15,130,507,000
Received from other sources	------
Total to account for	31,355,328,000
On hand December 31, 19__ (end of the year)	56,883,000
Delivered to the mains	31,298,445,000
Sold (per summary below)	29,791,110,822
Balance unaccounted for (transmission losses, etc.)	1,507,334,178
Per cent of cubic feet unaccounted for	4.8%

OPERATING REVENUES AND EXPENSES

Acct. No.	Operating Revenues:	No. of cu. ft. of Gas Sold	Amount	Per M. cu.ft. of Gas Sold
601 -	Metered sales to general consumers	29,174,868,835	$30,226,166.87	$1.036
602 -	Flat-rate sales to general consumers	---	--	
603 -	Prepaid gas sales	---	--	
604 -	Other gas corporations	457,298,000	243,749.47	.533
605 -	Municipal street lighting	64,054,387	51,690.45	.807
606 -	Miscellaneous municipal sales	94,889,600	93,581.19	.986
	Total sales of gas	29,791,110,822	$30,615,187.98	$1.028
	Miscellaneous Revenues (Net):			
611 -	Commission on other's gas		---	
612 -	Rent from gas appliances		$100,869.79	$.003
613 -	Rent from property used in operation		---	
614 -	Merchandise and jobbing		1,930.47	---
615 -	Miscellaneous operating revenues		63,611.94	.002
	Total miscellaneous revenues		$166,412.20	$ .005
	Total operating revenues		$30,781,600.18	$1.033

Acct. No.	Operating expenses:	Amount	Per M. cu.ft. of Gas Sold
700 -	Production expenses		
701-707-	Operation	$ 6,477,866.63	$ .207 (a)
708-709-	Maintenance	410,493.06	.013 (a)
710-	Gas from other sources	5,171,400.72	.165 (a)
711-	Power from other sources	71,339.06	.002 (a)
712-	Steam generated-apportionment account	214,441.91	.007 (a)
713-	Residuals produced -Cr.	240,731.35	.008 (a)
714-	Residuals expense	49,331.87	.002 (a)
715-	Duplicate production charges -Cr	--	
716-	Production expenses transferred -Cr.	328.53*	--- (a)
700-	Total production expense and average per M. cu. ft. produced	$12,154,470.43	$.388 (a)
	Add, cost of "balance unaccounted for"		.020 (b)
700-	Total production expense (as above) and average per thousand cubic feet sold	$12,154,470.43	$.408
720-	Transmission and distribution expenses	2,184,404.30	.073
730-	Street-Lighting expenses	4,318.57	---
760-	Commercial expenses	1,746,099.78	.059
770-	New-business expense	438,812.77	.015
780-	General and miscellaneous expense	4,225,248.24	.142
402-	Total operating expenses	$20,753,354.09	$.697
	New operating revenues	$10,028,246.09	$.336

*Red Figure.

(a) Computed on thousands of cubic feet of gas delivered to mains.

(b) The figures above this item show costs per thousand cubic feet of gas delivered to mains. The figures below it, in the same column, show the costs of transmission, distributation, etc., per thousand cubic feet of gas sold. It is shown in the preceding tabulation that of the total cubic feet of gas produced or received from other sources, there were 1,507,334,178 cubic feet unaccounted for and from which no revenue was received. The cost of producing this amount of gas (1,507,334,178 cubic feet) at 38.8 cents per thousand cubic feet was $584,845.66. This amount is included in the total production expenses of $12,154,470.43, shown above. Dividing the cost of production of this nonrevenue-producing gas, $584,845.66, by the number of cubic feet of gas sold, 29,791,110,822, shows a loss from this cause of approximately 2 cents per thousand cubic feet of gas sold. Adding this amount to the generating cost of 38.8 cents gives a cost of 40.8 cents for each thousand cubic feet of revenue-producing gas sold.

Figure 7 - Revenues and expenses per unit of gas produced and distributed.

WATER PUMPED, AND SOLD, AND OPERATING REVENUES AND EXPENSES IN CENTS PER THOUSAND GALLONS SOLD

Year Ended December 31, 19____

WATER PUMPED AND DISTRIBUTED

Gallons Pumped:	Gallons
Gallons pumped by electricity	2,601,336,143
Gallons pumped by steam power	764,032,952
Gallons of water delivered to the Mains	3,365,369,098 (a)

OPERATING REVENUES AND EXPENSES

Acct. No.	Operating Revenues:	Amount	¢ per M. Gals. Delivered to Mains (b)
601	Metered sales to general consumers	$356,517.93	
602	Flat-rate sales to general consumers	69,476.91	
603	Flat-rate sales to irrigation consumers	1,474.12	
604	Sales to other water utilities	1,768.59	
605	Municipal hydrant rental	61,465.41	
606	Miscellaneous municipal sales	6,740.70	
	Total sales of water	$497,443.66	14.78¢
	Miscellaneous Revenues:		
611	Commissions on others water		
612	Rent from water appliances		
613	Rent from property used in operation		
614	Merchandise and jobbing	$1,122.89	.03¢
615	Miscellaneous operating revenues		
	Total miscellaneous revenues	$1,122.89	.03¢
	Total water operating revenues	$498,566.55	14.81¢

Acct. No.	Operating Expenses:	Amount	¢ per M. Gals. Delivered to Mains
700	Source of water supply expenses	$9,260.99	.27¢
710	Pumping expenses:		
	Steam-power pumping	69,469.43	2.06
	Electric-power pumping	17,390.55	.52
	Total pumping expenses	$86,859.98	2.58¢
751-759	Purification expenses	$2,129.36	.06¢
761-763	Transmission and distribution expenses	37,201.49	1.11
771	Commercial expenses	13,008.29	.39
772	New-business expenses	--	--
781-790	General and miscellaneous expenses	110,686.11	3.29
	Total operating expenses	$259,146.22	7.70¢
	Net operating revenues	$239,420.33	7.11¢

(a) In this case it will be noted that the amount of water pumped corresponds with the amount delivered to the mains. This is not true in every case, as occasionally it is necessary to pump the water thru a filtering system into a settling tank and from there to the mains, in which case the amount pumped would be approximately twice the amount delivered to the mains, as each gallon of water must be pumped twice. There would be a certain amount of loss from pump slippage, waste, evaporation, etc.

(b) As a portion of this revenue is derived from the sale of water at flat rate for which no meter record is available, it is impossible to accurately determine the number of gallons of water consumed. Therefore the average rate in cents per gallon can not be computed for each class of service, and it is necessary to compute the average rate for all classes of service on the number of gallons of water delivered to the mains and not on the number of gallons consumed.

Figure 8- Revenues and expenses per unit of water pumped and delivered.

consumers and divide this equitably among all of the consumers of each class.

It is common practice to divide the rate schedule into blocks, applying a higher rate to the consumption until it reaches a certain point, the limit of the first block, and a descending scale of rates to the consumption in excess of that included in the first block. The computation of rates must be made with great care, and must be based upon the actual consumption or use of the service expected during the period for which the rates are made. It is usual to make the computation by using as a basis th consumption of a recent period. The consumption for the last year usually furnishes a fair basis for this purpose, provided du allowance is made for any probable increase or decrease. To compute the revenues by taking the consumers' bills and refiguring each one would require an enormous amount of labor, as it is usually necessary to try out various combinations of rates before an acceptable schedule is produced yielding the required gross revenue.

For the purpose of facilitating such computations, tables may be constructed in such form as will permit of easy computation of any rates or combinations of rates that may be desirable. Figures 9 and 10 are illustrations of such tables worked out for one class of electrical consumers and one table for gas consumers. The table for electrical consumers is limited to resident consumers, and includes only those resident consumers having a "connected load" of a given amount, 500 watts. It is usual to compute rates with reference to the demand or connected load (meaning the maximum demand that the consumers' lamps and other equipment connected with the company's system can make at any one instant). In case this is not done, but instead all consumers are charged rates without reference to the demand, separate schedules need not be made for the various connected load groups, but may all be included in one schedule. Usually, however, the rates for residence service are different from those for business use, and different from the rates for power service, so that different classifications will have to be made for these main divisions of the customers.

Explanation of Electrical Consumers' Statement. - Figure 9 shows the sales of electrical energy to all consumers of a certain company having a "connected load" of 500 watts each. The connected load of 500 watts includes the total capacity, in watts, of lamps and other electric appliances in use, all of which consuming energy for one hour would consumer 500 watt-hours ($\frac{1}{2}$ kw.hr.).

This is statement is only one of a series of like character which are necessary to calculate the total revenues in a given case. Separate tables are made for groups of consumers having connected loads of 400, 500, 550, or 600, etc. In order to avoid making too large a number of tables, unimportant fractions in the connected load are ignored.

The primary rate of 10 cents per kw-hr. is for the first 30 hours' burning of the full connected load, and the quantity is ascertained by multiplying the number of watts (500) by the number of hours (30), the result being the number of watt hours (15,000), and dividing this result by the number of watt hours in one kw-hr. (1,000), thus arriving at the number of kw-hrs. (15) for the first 30 hours' burning. By a like process the number of kw-hrs. for

TABULATION OF ELECTRIC CONSUMERS' MONTHLY BILLS

According to Kw-hrs. Consumed and According to Rate Blocks
(Consumers Having Connected Load of 500 Watts)

Year Ended December 31, 1924.

Number of Consumer Months (1)	Monthly Consumption (kw-hrs) (2)	Total Consumption (kw-hrs) (3)	First 30 hrs. Burning (kw-hrs) (4)	Next 30 hrs. Burning (kw-hrs) (5)	Over 60 hrs. Burning (kw-hrs) (6)
82	None				
19	1	19	19		
38	2	76	76		
50	3	150	150		
74	4	296	296		
263	Minimum Bills	541	541		
77	5	385	385		
74	6	444	444		
73	7	511	511		
66	8	528	528		
69	9	621	621		
78	10	780	780		
63	11	693	693		
51	12	612	612		
54	13	702	702		
46	14	644	644		
37	15	555	555		
37	16	592	555	37	
30	17	510	450	60	
30	18	540	450	90	
29	19	551	435	116	
13	20	260	195	65	
22	21	462	330	132	
19	22	418	285	133	
5	23	115	75	40	
12	24	288	180	108	
12	25	300	180	120	
10	26	260	150	110	
12	27	324	180	144	
4	28	112	60	52	
4	29	116	60	56	
2	30	60	30	30	
50	31 to 64	1909	750	750	409
1242	Total	13833	10840*	2043	409
Net rate per kw-hr			10¢	7¢	5¢
263 Minimum bills @ 50¢			131.50		
Amount of revenue derived from sales at above rates			$1,084.00	$143.01	$20.45

Total Revenues $1,378.96
* Does not include the 541 kw-hrs. included in the 263 minimum bills.

Figure 9- Tabulation of electrical consumers' monthly bills.

the next 30 hours burning is found to be the same, the rate for which is 7 cents per kw-hr. For all current consumed in any month in excess of 30 kw-hrs. (or 60 hours' burning) the rate is 5 cents per kw-hr.

The minimum monthly charge being 50 cents, of course all current consumed in less quantities than 5 kw-hrs. per consumer is at a higher rate than the primary rate of 10 cents per kw-hr.

Column 1 shows the number of months' use by all consumers having a connected load of 500 watts, and represents the number of bills rendered during the year to all such consumers.

Column 2 represents quantities of current used per consumer per month.

Column 3 shows the total consumption of current for the entire year of all consumers having a connected load of 500 watts.

The relation between the first three columns is very readily seen. The number of consumer months (column 1) multiplied by the monthly consumption in kw-hrs., (column 2), equals the total consumption in kw-hrs., (column 3.). In the case of the 50 consumer months (or 50 bills) of more than 30 kw-hrs. per month, some were for 31, some for 32, 35, 46, 50, 64, etc., and are condensed on one line for the sake of brevity, but if shown in detail the result would be the same.

The following will illustrate the table more in detail. One of the monthly bills included in the 50 on the last line above the total, is for 54 kw-hrs., billed as follows:

15 kw-hrs. (included in column 4)	@ 10¢	$1.50
15 kw-hrs. (included in column 5)	@ 7¢	1.05
24 kw-hrs. (included in column 6)	@ 5¢	1.20
54 kw-hrs. (total per column 3)		$ 3.75

In the table, the above bill is included in the count in column 1 as one "consumer month," and the total consumption, 54 kw-hrs., is included in column 3, the first 15 kw-hrs., in column 4, the next (or second) 15 kw-hrs in column 5, and all current consumed over or in excess of 30 kw-hrs., is included in column 6 , and the proper rates under the schedule are applied to each , as shown.

From the illustration just given, as to one bill, we may follow the computation involved in the total of the 50 bills showing monthly consumption ranging from 31 to 64 kw-hrs., the total quantity of current used being 1,909 kw-hrs., as shown in column 3. The computation of the total quantities and amounts of the 50 bills as follows:

750 kw-hrs.	(included in column 4)	@ 10¢	$75.00
750 kw-hrs.	(included in column 5)	@ 7¢	52.50
409 kw-hrs.	(included in column 6)	@ 5¢	20.45
1,909 kw-hrs.	(total, per column 3)		$147.95

In the foregoing table all bills (or consumer months) are shown in the exact number of kw-hrs. consumption, except the last 50 bills, which are for more than 30 kw-hrs. each. It is desirable to show the smaller bills in this manner, for the reason that a change in the minimum monthly bill may be contemplated, and sufficient detail is required, so that the result of various minimum amounts may be computed.

Should it be desired to increase the amount of the minimum bill to $1.00, the effect of such increase in the foregoing table, leaving the other rates as they are, is illustrated in the following.

Since the quantity consumed in the first 30 hours burning is 15 kw-hrs., and the rate for the same is 10 cents per kw-hr.,

$1.00 would pay for 10 kw-hrs., so that the computation of the totals for the minimum bills (consumptions of less than 10 kw-hrs.), would then be made below the line showing 9 kw-hrs., in column 2. The total number of kw-hrs., included in the first block, (column 4), of figures at 10 cents per kw-hr. would, of course, be reduced by the same amount to be added to the minimum bills.

In designing the form for a tabulation of this kind, the rate blocks which the company under consideration has in effect would be used. If any changes in rate blocks are likely to be considered by the company or by the commission, appropriate division should be made in the table, so that computations may be easily made and used to forecast the probable revenues under the proposed rates and rate blocks.

Explanation of Gas-Consumers Statement.- In Figure 10, Column 1 shows the number of months use by all consumers, and represents the number of consumers' bills rendered during the year.

Column 2 represents quantities used per consumer per month within the limits indicated.

Column 3 shows the total consumption of all consumers for the whole year.

The relation between the first 3 columns may be explained as as follows by referring to the thirteenth line:

24,402 is the number of consumers' monthly bills rendered during the year, where the quantity of gas used ranged between 1,100 and 2,000 cubic feet,(both inclusive) per month, as shown in column 2.

Column 3 shows the aggregate annual consumption, 36,442,500,

TABULATION OF GAS CONSUMERS' MONTHLY BILLS

According to

QUANTITIES CONSUMED AND RATE BLOCKS

Year Ended December 31, 1924

Number of Consumer Months (1)	Monthly Consumption (cu.ft.) (2)	Total Consumption (cu.ft.) (3)	First 5,000 cu.ft. (4)	Next 5,000 cu.ft. (5)	Next 10,000 cu.ft. (6)
3,192	None				
2,235	100	223,500	223,500		
3,070	200	614,000	614,000		
3,217	300	965,100	965,100		
11,714	Total Minimum Bill	1,802,600	1,802,600		
3,357	400	1,342,800	1,342,800		
3,558	500	1,779,000	1,779,000		
3,157	600	1,894,200	1,894,200		
3,233	700	2,263,100	2,263,000		
3,094	800	2,475,200	2,475,200		
3,597	900	3,237,300	3,237,300		
3,487	1,000	3,487,000	3,487,000		
24,402	1,100 to 2,000	36,442,500	36,442,500		
10,673	2,100 to 3,000	26,428,600	26,428,600		
3,894	3,100 to 4,000	13,594,700	13,594,700		
1,804	4,100 to 5,000	8,091,200	8,091,200		
1,005	5,100 to 6,000	5,542,600	5,025,000	517,600	
560	6,100 to 7,000	3,597,600	2,800,000	797,600	
335	7,100 to 8,000	2,524,300	1,675,000	849,300	
223	8,100 to 9,000	1,869,400	1,115,000	754,400	
141	9,100 to 10,000	1,340,700	705,000	635,700	
90	10,100 to 11,000	956,100	450,000	450,000	56,100
91	11,100 to 12,000	1,290,600	455,000	455,000	380,600
70	12,100 to 13,000	880,900	350,000	350,000	180,900
34	13,100 to 14,000	459,300	170,000	170,000	119,300
37	14,100 to 15,000	538,600	185,000	185,000	168,600
24	15,100 to 16,000	372,100	120,000	120,000	132,100
22	16,100 to 17,000	364,600	110,000	110,000	144,600
26	17,100 to 18,000	455,200	130,000	130,000	195,200
15	18,100 to 19,000	277,600	75,000	75,000	127,600
24	19,100 to 20,000	470,300	120,000	120,000	230,300
78,667	Total	123,778,100	114,520,600*	5,719,600	1,735,300
Net Rate per M. Cu. ft.			$1.50	$1.45	$1.40
11,714 Minimum Bills @$.50			$ 5,857.00		
Amount of Revenue derived from sales at above rates			171,780.90	8,293.42	$2,429.42
Total Revenues $188,360.74					

* Does not include the 1,802,600 cu.ft. of gas used by the consumers who were charged with the minimum bill.

Figure 10- Tabulation of gas consumers' monthly bills

as shown by all of the 24,402 monthly bills. The amount, 36,442,500, is obtained by adding together the consumption on all of the 24,402 bills, some of which were for 1,100 cubic feet, some for 1,200, some for 1,300, and so on up to 2,000 cubic feet. In reading meters the registration is recorded only in hundreds of cubic feet, fractions being omitted.

To explain this table more in detail, let us take one of the monthly bills included in the 24 shown on the last line above the total. The bill selected shows, 19,500 cubic feet of gas consumed in one month, which is billed at the following rates:

Rate Blocks cu. ft.		Rate and Extension per M. cu.ft.	
5,000	(included in column 4) @	$1.50 =	$ 7.50
5,000	(" " " 5) @	1.45 =	7.25
9,500	(" " " 6) @	1.40 =	13.30
19,500	Total per column		$ 28.05

In the table, this bill is included in the count in column 1 as one "consumer month," and the total consumption 19,500 cubic feet is included in column 3. The first 5,000 cubic feet consumed, charged at $1.50 per M. cubic feet, are included in column 4, the second, charged at $1.45 per M, are included in column 5, and the balance, which is less than 10,000 cubic feet (which constitutes the next block) is included in column 6.

From the foregoing illustration, showing an analysis of one bill, we may follow the computation involved in the totals of the 24 bills from which the one bill was selected as follows:

During the year, twenty-four monthly bills showed quantities of gas used ranging between 19,000 and 20,000 cubic feet (both inclusive). The sum of the quantities used, as shown by these twenty-four bills, was 470,300 cubic feet, as is indicated in column 3. Since each of these twenty-four bills was for quantities used amounting to more than 19,000 cubic feet, it is clear that for each of these bills 5,000 cubic feet, or a total of 120,000 cubic feet (5,000 x 24 = 120,000), should be placed in column 4 and a like amount in column 5, as is indicated by the column headings. After having distributed a total of 10,000 cubic feet in columns 4 and 5, the remainder of each bill is not more than 10,000 cubic feet (maximum bill of this group was for 20,000 cubic feet), and should therefore be included in column 6.

In designing the form for a tabulation of this kind, the rate blocks which the company under consideration has in effect should be used. If any changes in rate blocks are likely to be considered by the company or by the commission, appropriate division should be made in the table, so that it may be used to forecast the probable revenues under the proposed rates and rate blocks.

In Figure 10 all bills for less than 1,000 cubic feet are shown in hundreds of cubic feet. This is done because it is frequently desirable to change the amount of the minimum bill, necessitating sufficient detail so that the results of various minimum amounts may be computed.

If it were desired to ascertain the effect of increasing the minimum bill, in Figure 10, to $1.00 and leave the other rates as they are, the results would be as follows:

Since the rate for the first block is $1.50 per M. cubic feet

$1.00 would pay for two-thirds of a thousand, or 666 cubic feet of gas. However, as the meters are read only in even hundreds of cubic feet, it follows that the minimum amount of $1.00 would be charged in all cases where the consumption did not exceed 600 cubic feet per month, and that where 700 cubic feet or more were used, the rate of $1.50 per M. cubic feet would apply for the first block.

The computation of the totals for the minimum bills would then be made below the line showing 600 cubic feet in column 2. The total number of cubic feet included in the first block and figured at the high rate must, of course, be reduced by the additional amount which will be billed under the minimum bills.

The advantage in the use of this table is that instead of trying out a new or proposed schedule of rates by extending each consumer's bill at the proposed rate and totaling them to see what the total revenues of the company would be under such new rates, the work is greatly simplified and any number of rates may be figured out quickly, as the table shows in separate totals all of the gas that would be paid for at each of the rates named in the proposed schedules.

The form of statement for a water utility in making tabulations of water sales for the purpose of computing rates when water is sold by meter would be the same as that presented in Figure 10. Where the meters register in gallons, this unit will of course be used in the table.

Reader's Test of Subject Matter in Chapter VI

The following questions are given to enable the reader to check himself as to his grasp of the important points discussed under the subject, "The Utility-Rate Problem."

1. If you were asked to prepare a report of an electric, gas, or water utility for the purpose of determining a fair rate for services rendered by the utility to its customers, outline the order of your procedure.
2. For the return allowed to the owners of public-utility property, what is the basis of valuation used by commissions?
3. Discuss the opinions of the Supreme Court with reference to the consideration of original cost and reproduction cost in the determination of fair value for rate-making purposes.
4. Discuss the extent to which reproduction cost is given consideration. Point out the advantages and disadvantages from the standpoint of investor of using reproduction cost as basis of valuation.
5. Explain the effect in a rate case of including in the fixed-capital accounts the excess cost of replacing an important unit over the original cost of the unit replaced. Compare with the result if entire cost of new unit were charged to operation as maintenance, noting particularly the effect on rate of return and rates charged customers.
6. How is the amount of depreciation actually existing in the physical property at the date of valuation determined?
7. In preparing an accounting report for a commission, what facts with reference to the history and the classification of the property should be considered? If the records of original cost are incomplete, what course may be taken with a view to ascertaining the amount expended in constructing the property?
8. In making valuations of property, what consideration should be given to property falling under the following classifications:
    (a) Gifts, grants, and donations.
    (b) Property not used and useful.
    (c) Property owned but not used.
    (d) Property used but not owned.
    (e) Property acquired thru earnings.
9. Discuss the various methods used in determining the "going value" of a utility for the purpose of rate making.
10. In a valuation for rate-making purposes, what consideration should be given to working capital?
11. What is the rule generally followed in the apportionment of property between different departments in cases where the company operates two or more classes of utilities?
12. What is the opinion of the Supreme Court with reference to the rate of return on property valuation?
13. Outline the matters to be considered in determining the cost of operation.
14. State the elements in the cost of serving a consumer.
15. Outline the methods of apportioning steam production costs, supervision, general expenses, and taxes.
16. What is the purpose of preparing statements like those in Figures, 6, 7, and 8?
17. What is the advantage in the use of a tabulation as shown in Figure 10?

CHAPTER VII

FINANCING PUBLIC UTILITIES

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The essential points brought out in this section are briefly summarized in the following:

1. Public-utility security issues are classified and fully explained.
2. Methods of accounting for discount and premium on capital stock are explained.
3. The extent to which the state commission may control the issue of securities is set forth.
4. The commission may make valuation of property for the purpose of a security issue.
5. The purchase of a plant already in operation requires the approval of the commission, both as to the transfer of the property and the issue of securities to pay for it.
6. Values for capitalization are not the same as for other purposes.
7. Where property is acquired by corporate merger or consolidation, differences exist in the legal processes and the method of valuation.
8. How securities may be issued to acquire working capital.
9. Interest on capital used for construction purposes may be capitalized until property is ready for operation.
10. Provisions for fortifying the security of bonds are set forth.
11. Sinking-fund bonds for public utility-financing is becoming less common.
12. Proportion of stocks and bonds issued by public-utility corporations.
13. Commission regulation must be co-operative and not merely negative in character.
14. The plan of selling securities among customers has certain advantages.

Public-Utility Security Issues Classified.- The security issues of public utilities are not in their essential characteristics different from those of corporations engaged in other business enterprises. In general, however, a larger proportion of the capitalization of public utilities is represented by bonds and other evidences of indebtedness than is the case in other industries. It is not uncommon to find public utilities with 60 per cent or more of the total capitalization represented by bonds, the average percentage being between 50 and 60 per cent.

The various classes of capital stock, bonds, and other forms or evidences of indebtedness, in general use among public utilities, are classified in the following:

- Capital Stock:
  - Common.
  - Preferred.
  - Debenture.
- Long-Term Debt:
  - Mortgage bonds.
  - Collateral trust bonds.
  - Income bonds.
  - Equipment obligations.
  - Miscellaneous obligations.
  - Receipts outstanding for long-term debt.
- Notes Payable.
- Receiver's Certificates.
- Advances from Affiliated Companies.
- Matured Long-Term Debt Unpaid.

The definitions and accounting rules with respect to these securities are given in the following excerpts from the Uniform Classification of Accounts, adopted by the National Association of Railway and Utility Commissioners:

> Capital Stock
>
> This account shall include the items described under the following subheads:

(a) Full-paid stock. This covers the total par value of stocks or receipts issued to represent permanent full-paid interests in the accounting company, or interests which, if terminated, are so only at the option of the company. By "full-paid interest" is meant an interest in which the full amount of the subscription has been paid in.

(b) Installments paid on stock subscriptions. This covers the amount of installments paid on subscriptions for capital stock. When the full amount of the subscription has been paid and certificates of stock are issued therefor, this account shall be cleared and the par value of the stock so issued shall be credited to the account appropriate for such stock.

(c) Stock liability for coversion. This covers the accounting company's liability under agreements to exchange its capital stock for the outstanding securities of companies whose physical property has been acquired under such agreements, but whose securities have not yet been surrendered for exchange.

The following is the most important classification of stock.

(a) Common stock. Stock which has no preference in the distribution of dividends.

(b) Preferred stock. Stock having preference in the distribution of dividends.

(c) Debenture stock. Stock issued under a contract to pay a specified return at specified intervals.

Preferred stock may be further classified as first preferred, second preferred, etc.; or as cumulative or noncumulative; or as participating or nonparticipating. First-preferred stocks are those which have the first claim upon such dividends as may be distributed; a claim upon dividends taking precedence over the claim of common stock, but inferior to the first-preferred stock, may be represented by second-preferred stock, and so on. Stock is cumulative if the amount by which the dividend at any dividend period fails to reach a stipulated dividend rate and is carried forward to continue as a claim upon the dividend fund until satisfied. Stock is noncumulative if such amount lapses. Stock is participating if it is not limited to a stipulated rate in the amount of dividends which it may receive but is entitled to participate, in accordance with the terms of the contract under which it is issued, in further dividends. It is nonparticipating if it is limited to a stipulated rate.

Stocks may differ also with respect to voting provisions and conditions under which they may be retired. A separate ledger account should be maintained for each class of stock issued, and no two stocks shall be considered of the same class unless they are equal in their interest or dividend rights, their voting rights, and the conditions under which they may be retired. The characteristics of any class of stocks in these three regards shall be designated in the title of the account raised to cover such stocks and shall be clearly expressed in the first entry of such account. To the account for any class of stock shall be credited, when issued, the par value of the amount of stock of that class issued. If such issue is for money, that fact shall be stated; and if for any other consideration than money, the person to whom issued shall be designated and the consideration for which issued shall be described with sufficient particularity to identify it; if such issue is to the treasurer or other agent of the corporation to be by him disposed of for the benefit of the corporation, that fact, and the name of such agent, shall be shown; and such agent shall, in his account of the disposition thereof, show the like details concerning the consideration realized thereon, which account when accepted by the corporation, shall be preserved as a corporate record. If the fair cash value of the consideration realized upon the issue of any amount of stock is greater than the par value of such stock and accrued dividends, if any, expressed in the contract of issue, the excess shall be credited to account No. 202, "Premium on Capital Stock," and corresponding reference thereto shall be contained in the entry relating to such stock in the stock account.

For each class of stock the records shall also show plainly the par value of (1) certificates issued and actually outstanding, being those not held by the company, its agents, or trustees, or subject to its control; and (2) certificates pledged and unpledged held in the company's treasury, by its agents, of trustees, or otherwise subject to its control, including both those acquired after actual issue and those nominally but never actually issued.

Capital stock is considered nominally issued when certificates are signed and sealed and placed with the proper officer for sale and delivery, or pledged, or otherwise placed in some special fund of the accounting company. It is considered to be actually issued when it has been sold to a bona fide purchaser for a valuable consideration, and such purchaser holds it free from all control by the accounting company. All capital stock actually issued and not reacquired by or for the accounting company is considered to be actually outstanding. If reacquired by or for the accounting company, under such circumstances as required it to be held alive and not canceled or retired, it is considered to be nominally outstanding.

When stock without par value is issued, the actual money value of the consideration realized from the issue should be credited to the account representing that particular class of stock.

Long-Term Debt

This account shall include the total par value of all debts except receiver's certificates and advances from affiliated companies (for which see next page), which, by the terms of its creation, does not mature until more than one year after date of creation. This covers bonds, notes, mortgage certificates, and all other forms of acknowledgement of indebtedness.

The records shall be so kept that long-term debts of different classes may be separately shown. The most important classification is that based upon the nature of the lien or security, as follows:

(a) *Mortgage bonds.* Bonds secured by a lien on physical property and not includable in the other subdivisions of this account.

(b) *Collateral trust bonds.* Bonds and notes having a date of maturity of more than one year after date of issue, secured by a lien on securities or other commercial paper; also stock trust certificates that are similar in character to collateral trust bonds.

(c) *Income bonds.* Bonds which are a lien on the accounting company's revenue alone, or bonds which, while being a lien on its property and franchises, can claim payment of interest only in case interest is earned.

(d) *Equipment obligations.* Equipment bonds, equipment notes, or other obligations secured by lien on specific equipment.

(e) *Miscellaneous obligations.* All long-term obligations not provided for in the four preceding classes, including notes, unsecured certificates of indebtedness, debenture bonds, plain bonds, real estate mortgages executed or assumed, and other similar obligations maturing more than one year after date of issue.

(f) *Receipts outstanding for long-term debt.* Receipts for payment on account of long-term-debt securities. When the securities are issued for amounts so paid, the face value shall be included in the account covering the class of funded debt for which the securities are issued.

Long-term debts may differ also with respect to rates of interest, interest dates, and date of maturity. Separate ledger accounts shall be maintained for each class of long-term debt, and no two amounts of debts not agreeing in respect of all four of the characteristics above named shall be included in the same ledger account, except that part of any long-term debt issue agreeing in other characteristics, but maturing serially, may be treated as of the same class. The title of each ledger account for long-term debts shall express the four characteristics above stated, that is to say, mortgage or other lien or security, rate of interest, dates of maturity of interest, and date of maturity of principal, as, e. g., "First mortgage 5 per cent, Q. F. 10, August 10, 1928," which means a debt secured by the company's first mortgage, bearing interest at the rate of 5 per cent per annum, interest maturing quarterly on February 10, May 10, August 10, and November 10, of each year, principal maturing August 10, 1928.

For each class of long-term debt the records shall also show plainly (1) the par value of certificates or other evidences of debt issued and actually outstanding, being those not held by the company, its agents or trustees, or subject to its control; and (2) the par value of certificates or other evidences of debt pledged or unpledged held in the company's treasury, held by its agents or trustees, or otherwise subject to its control; including both those reacquired after actual issue and those nominally but never actually issued.

Securities maturing one year or less from date of issue shall be included in Account No. 221, "Notes Payable." Matured long-term debts shall be included in Account No. 226, "Matured Long-Term Debt Unpaid."

Long-term-debt securities are considered to be nominally issued when certified by trustee and placed with the proper officer for sale and delivery, or pledged or otherwise placed in some special fund of the accounting company. They are considered to be actually issued when they have been sold to a bona fide purchaser for a valuable consideration, and such purchaser holds them free from all control by the accounting company. All securities actually issued and not reacquired and held by or for the accounting company under such circumstances as require them to be considered as held alive and not canceled or retired are considered to be nominally outstanding. If reacquired by the accounting company, under such circumstances as require them to be considered as held alive and not canceled or retired, they are considered to be nominally outstanding.

Notes Payable

This account shall include the balances representing outstanding obligations in the form of notes, drafts, acceptances, or other similar evidences of indebtedness payable on demand or within a time not exceeding one year from date of issues.

Secured notes and time loans payable more than one year from date of issue shall be included in account, "Long-Term Debt."

Altho demand notes are treated as short-term notes in the uniform classifications of accounts, being includable in the accounts, "Notes Payable" and "Advances from Affiliated Companies," they are not always so considered by commissions in determining whether the issue of such notes requires the approval of the commission in cases where the law permits the issue of short-term notes without authorization by the commission.

In Illinois and in some other states, it has been held that since a demand note may not mature until more than twelve months from date, its issue should be approved by the commission where the law does not refer to demand notes, but provides that no evidences of indebtedness payable more than twelve months after date of issue shall be issued without approval.

Receiver's Certificates

> When any receiver, acting under the orders of a competent court, is in possession of the property of a corporation, and under the orders of such court, issues certificates of indebtedness chargeable upon such property, the par value of such certificates shall be included in this account.
>
> Separate subaccounts shall be maintaned for receiver's certificates which mature in more than one year and those which mature in one year or less from date of issue.

Advances from Affiliated Companies

Under this title a separate account is provided in the uniform classification of accounts for nonnegotiable notes and credit balances in open accounts not subject to current settlement. The text of this account is as follows:

> "This account shall include the par value of nonnegotiable notes due to affiliated companies, credit balances in open accounts with such companies, other than credit balances in current accounts classable as current liabilities, and interest accrued on notes and open accounts included in this account, when such interest is not subject to current settlement. Two companies are affiliated if either one controls the policy of the other, or if both are subject to the same control.
>
> "This account shall be subdivided as follows:
>
> a. Notes, including both time and demand notes.
>
> b. Open accounts not subject to current settlement.
>
> c. Interest accrued on amounts included in this account

when not subject to current settlement.

> "Accounts with affiliated companies which are subject to current settlements, such as charges for materials and supplies currently furnished, charges for repairs to equipment, etc., shall be classed as current assets or current liabilities, as may be appropriate. Negotiable notes due to affiliated companies shall not be included in this account, but in Account No. 221, Notes Payable."
>
> Matured Long-Term Debt Unpaid
>
> Under this title a separate account classified as a current-liability account is provided, in which is included the amount of long-term debt matured and unpaid without specific agreement for extension as to time of payment. This includes also unpresented bonds drawn for payment thru the operation of sinking and redemption fund agreements.

Discount and Premium on Capital Stock.- In some of the states, par value stock cannot be sold at a discount, while in other states it may. In a few states it is left to the discretion of the commission as to the price for which it may be sold. No serious objection has been raised to the issue of stock at a premium; that is, at a price above its par value. In some states it is required that the old stockholders be given an opportunity of subscribing for new issues at par. Usually the entire amount is taken by the old stockholders where the market value is above par.

The methods of accounting for discount and premium on capital stock are provided for in the Uniform Classification of Accounts of the National Association of Commissioners, in which separate accounts are provided for discount on capital stock and premium on capital stock. It is provided that entries in these accounts representing discounts shall be carried therin until offset--

1. By premiums realized on subsequent sales of the same class of stock.

2. By assessment levied on the stockholders.

3. By appropriations from surplus for that purpose.

4. By charges to profit and loss upon reacquirement of the stock.

Entries in these accounts representing premiums realized shall be carried therein until offset--

1. By discount suffered on sales of the same class of stock.

2. By credits to profit and loss upon reacquirement of the stock.

In case the accounting company is permitted and elects to distribute all or any part of the net premium on its capital stock to its stockholders, the amount thus distributed shall be charged to the premium account.

For the purpose of this classification the premium realized on the sale of capital stock shall not be considered a profit and loss item except upon reacquirement of the stock sold.

In no case shall discount on capital stock be charged to or included in any account as a part of the cost of acquiring any property, tangible or intangible, or as a part of the cost of operation.

When stock which has been issued or assumed by the accounting company is reacquired, the difference between the price paid and the par value of the stock shall be credited or charged to profit and loss, as may be appropriate. Concurrently, the premium or discount account for the particular issue of stock reacquired shall be adjusted thru profit and loss to the extent of the premium or discount applicable to the shares reacquired. This does not apply to the purchase of securities solely for special funds in which the accounting company carries at cost instead of par value securities issued or assumed by itself.

Accounting for Bond Discount and Premium.- The Uniform Classification of Accounts provides the accounts "Unamortized Debt Discount and Expense" and "Unamortized Premium on Debt" for the purpose of recording discount, expense, and premiums at the sale of long-term debt. In connection with these accounts the following definitions and instructions apply:

> "By the term 'discount' is meant the excess of the par value of the securities issued or assumed, and accrued interest thereon, over the actual cash value of the consideration received for such securities. By the term 'premium' is meant the excess of the actual cash value of the consideration received for securities issued or assumed over the par value of such securities and the accrued interest thereon.
>
> "By the term 'expense' is meant all expenses in connection with the issue and initial sale of evidences of debt, such as fees for drafting mortgages and trust deeds; cost of printing bonds, certificates of indebtedness, and other commercial paper having life of more than one year; fees paid trustees acting under mortgages and trust deeds; fees paid for legal services to trustees relative to mortgage securities; fees and commissions paid underwriters and brokers for marketing such evidences of debt; and other like expense.
>
> "Each month (or other accounting period) there shall be charged to income account, 'Amortization of Debt Discount and Expense,' a proportion (based upon the ratio of such fiscal period to the remaining life of the respective securities) of each of the debit balances in these accounts, and correspondingly there shall be credited to income account, 'Amortization of Premium on Debt,' a similar proportion of each of the credit balances in these accounts.
>
> "When any long-term debt which has been actually issued to bona fide holders for value is reacquired by the accounting company, a proportion of the balance remaining in the accounts

> covering discount, expense, and premium on long-term debt of the class of security reacquired shall be credited or charged, as may be appropriate, to profit and loss. Such proportion shall be based upon the ratio of the par value of the security reacquired to the par value of all the securities of the same class actually outstanding immediately before such reacquirement. This does not apply to the purchase of securities solely for special funds in which the accounting company carried at cost instead of par value securities issued or assumed by itself.
>
> "Except as provided in Account No. 355, 'Interest during Construction,' no discount on long-term debt shall be charged to or included in any account as a part of the cost of acquiring any property, tangible or intangible, or as a part of the cost of operation."

Begin

State Regulation of Security Issues.- Control of the issue of securities of public utilities has not been placed under the jurisdiction of the commission in all states having commissions with regulatory authority over rates, service, accounting, and other matters. While a few states have adopted a modified form of regulation, the majority of states that have established control over such issues have adopted practically absolute control. Twenty of the states have adopted this policy and enacted laws requiring public utilities to procure the approval of the state commission before the issue of stocks, bonds, and other classes of security issues.

The jurisdiction of these commissions extends to the issues of railroads operating within the state. However, the jurisdiction over railroad issues has been assumed by the Federal government, and Congress, by amendment of the Interstate Act of 1920, gave the state commerce commission exclusive jurisdiction over the issue of common carriers doing an interstate business. Provision was made that the state commission should receive and consider any representations made by state commissions, but may extend its own judgment as to the approval or disapproval of the issue.

The issue of securities is controlled to some extent by corporation laws of the states under which charter powers are conferred, and to some extent by the public-utility acts. It is manifestly impossible within the limits of a single volume to make full references to all pertinent features of the corporation laws and of the public-utility commission laws of all of the states, so far as they relate to the financing of public-service corporations. These laws are subject to change, and, in fact, are being amended in some particulars from year to year. It is, therefore, advisable for anyone interested in this subject to become familiar with the provisions of law relating to security issues of public-utility corporations in the state or states in which the subject is of particular interest to him.

The extent of the authority assumed by the states in respect to security issues and the purposes for which such issues may be authorized is indicated by the following extract from the Illinois Commerce Commission Act, Section 20, which is typical of the statutory provisions in states that have adopted a policy of absolute control of security issues.

Purposes for Which Securities May Be Issued.

> "Subject to the provisions of this Act, and of the order of the commission issued as provided in this Act, a public utility may issue stocks and stock certificates, and bonds, notes, and other evidences of indebtedness, payable at periods of more than twelve months after the date thereof, for the following purposes and no others, namely: For the acquisition of property, or for the construction, extension, or improvement of, or addition to, its facilities,

or for the discharge or lawful refunding of its obligations; or for the reimbursement of moneys actually expended from income or from other moneys in the treasury of the public utility not directly or indirectly secured by or obtained from the issue of stocks or stock certificates, or bonds, notes, or other evidence of indebtedness of such public utility, within five years next prior to the filing of an application with the commission for the required authorization, for any of the aforesaid purposes except maintenance of services, replacements, and substitutions in cases where the applicant shall have kept its accounts and vouchers for such expenditures in such manner as to enable the commission to ascertain the amount of moneys so expended and the purposes for which such expenditures were made, and the sources of the funds in the treasury of the public utility applied to such expenditures.

Authorization of Commission Required

"Provided, that such public utility, in addition to the other requirements of law, shall first have secured from the commission an order authorizing such issue, and stating the amount thereof and the purpose or purposes to which the issue or the proceeds thereof are to be applied, and that, in the opinion of the commission, the money, property, or labor to be procured or paid for by such issue is reasonably required for the purpose or purposes specified in the order, and that, except as otherwise permitted in the order in the case of notes or other evidences of indebtedness, such purpose or purposes are not, in whole or in part, reasonably chargeable to operating expenses or to income.

Investigation by Commission

"To enable it to determine whether it will issue such order, the commission shall hold a hearing, and may make such additional inquiry or investigation, and examine such witnesses, books, papers, accounts, documents, and contracts and require the filing of such data as it may deem of assistance. The public utility may be required by the commission to disclose every interest of the directors of such public utility in any transaction under investigation. The commission shall have power to investigate all such transactions and to inquire into the good faith thereof, to examine books, papers, accounts, documents, and contracts of public utilities, construction or other companies or firms or individuals with whom the public utility shall have had financial transactions, for the purpose of enabling it to verify any statements furnished, and to examine into the actual value of property acquired by or services rendered to such public utility. Before issuing its order, the commission, when it is deemed necessary, shall make an adequate physical valuation of all property of the public utility, but a valuation already made under proper public supervision may be adopted, either in whole or in part, at the discretion of the commission; and shall also examine all previously authorized or outstanding securities of the public utility, and fixed charges attached thereto. A statement of the results of such physical valuation, and a statement of the character of all outstanding securities, together with the conditions under which they are held, shall be included in the order. The commission may require that such information, or such part thereof as it thinks proper, shall appear upon the stock, stock certificates, bond, note, or other evidence of indebtedness authorized by its order. The commission may by its order grant permission for the issue of such stock certificates, or bonds, notes, or other evidences of indebtedness, in the amount applied for, or in a lesser amount, or not at all, and may attach to the exercise of its permission such condition or conditions as it may deem reasonable and necessary. The commission may also require the public utility to compile for the information of its shareholders such facts in regard to its financial transactions in such form as the commission may direct.

Application of Funds

"No public utility shall, without the consent of the commission, apply the issue of any stock or stock certificate, or bond, note, or other evidence of indebtedness, or any part thereof, or any proceeds thereof, to any purpose not specified in the commission's order or to any purpose specified in the commission's order in excess of the amount authorized for such purpose; or issue, or dispose of the same on any terms less favorable than those specified in such order, or a modification thereof. The commission shall have the power to require public utilities to account for the disposition of the proceeds of all sales of stocks and stock certificates, and bonds, notes, and other evidences of indebtedness, in such form and detail as it may deem advisable, and to establish such rules and regulations as it may deem reasonable and necessary to insure the disposition of such proceeds for the purpose or purposes specified in its order."

Short Term Notes.- In most of the public-utility laws of the states it is provided that companies may issue notes maturing within one year from date without securing the approval of the commission. In some states such notes may be renewed from year to year but cannot be re-funded by an issue of stock or bonds or other evidence of indebtedness maturing more than twelve months from date without the consent of the commission.

In Illinois, notes maturing within twelve months from date of issuance may be renewed for an aggregate period of not more than two years without the approval of the commission; for instance, a note issued to mature in six months could at the date of maturity be renewed for one year or less, and at the second maturity could be renewed for one year or less. Under this provision it is possible to issue and renew short-term notes for an aggregate period of three years without obtaining the approval of the commission. The law on this subject is as follows.

> " A public utility may issue notes, for proper purposes, and not in violation of any provision of this Act or any other Act, payable at periods of not more than twelve months after the date of issuance of the same, without the consent of the commission, but no such note shall, in whole or in part, be renewed from time to time without the consent of the commission for an aggregate period of longer than two years, or be re-funded by any issue of stocks and stock certificates, or of bonds, notes of any term or character, or any other evidence of indebtedness, without the consent of the commission."

Capitalization of Intangible Capital.- The provisions with respect to the capitalization of franchises in the various states are in substantial agreement with the rules embodied in the National Commissioners' Classification of Accounts and which are included in the Illinois law in the following language:

> "The commission shall have no power to authorize the capitalization of the right to be a corporation, or to authorize the capitalization of any franchise, license, or permit whatsoever, or the right to own, operate, or enjoy any such francise, license, or permit in excess of the amount (exclusive of any tax or annual charge) actually paid to the state or to a political subdivision thereof as the consideration for the grant of such franchise, license, permit, or right, nor shall any contract for consolidation or lease be capitalized, nor shall any public utility hereafter issue any bonds, notes, or other evidences of indebtedness against or as a lien upon any contract for consolidation or merger."

With respect to the capitalization of organization expense, the statutes are not usually as explicit in defining the expenditures incident to organization of public utilities which may be capitalized. The definition of this class of expense accepted in most of the states is found in the Uniform Classifiction of Accounts approved by the National Association of Railway and Utility Commissioners, being included in the text of account, "Organization," in the fixed-capital accounts, and which reads as follows:

> "This account shall include all fees paid to governments for the privilege of incorporation and all office and other expenditures incident to organizing the corporation or other enterprise and putting it into readiness to do business. This covers cost of preparing and distributing prospectuses, cost of soliciting subscriptions for stock (but not for loans or for the purchase of bonds or other evidence of indebtedness), cash fees paid to promoters, and the actual cash value at the time of organization of securities paid to promoters for their services in organizing the enterprise, counsel fees, cost of preparing and issuing certificates of stock, and cost of procuring certificates of necessity from state authorities, and other like costs; also costs incident to preparing and filing certificates of authorization of increase of capital stock and to the negotiation and issue of stock thereunder, and of preparing and filing certificates of amendment of articles of incorporation. This account should not include any discount on stocks or other securities issued, not should it include any costs incident to negotiating loans or selling bonds or other evidences of indebtedness."
>
> Note -- Cost of preparing and filing papers in connection with the extension of the term of incorporation or with reincorporation consequent upon reorganization should be charged to Account No. 931, "Law Expense," or by companies in Class C or Class D, to the account of which "Law Expenses" is a subdivision.

Commission May Make Valuation of Property.- The commission is authorized to make a valuation of the property of public utilities in connection with proposed issue of securities in cases where the commission deems this action necessary. The commission is also given very full power of investigation thru the examination of witnesses, books, papers, accounts, and contracts, and authority to inquire into all transactions which the company may have with individuals, public utilities, construction or other companies, with whom the utility shall have had financial transactions. This full power of investigation enables the commission to obtain sufficient information, so that a complete valuation is not required in as many cases as it would be if its power of investigation were less comprehensive.

The authority to make an adequate valuation of the property is broad enough to give the commission power to make a valuation of the entire property of a utility, including that already owned, as well as the property that the applicant proposes to acquire. However, complete valuations are rarely made in cases where it is proposed to issue securities to provide only for the actual cost of additions, improvements, and extensions. Generally, the property to be acquired and the construction work to be paid for out of the proceeds of new securities are considered to be worth their cost.

In the case of the acquisition of property under circumstances in which the value cannot readily be gauged by known facts as to current labor and commodity prices, an appraisal is necessary. Instances of this kind are found in the acquisition of lands, flowage rights, and other property or rights in property incident to the establishment of a water-power development.

Purchase of a Plant in Operation. - The purchase by a public-utility company of a plant already in operation requires the approval of the commission, both as to the transfer of the property and the issue of securities to pay for it. The considerations involved in the question as to whether the transfer of the property should be approved, are mainly matters of public policy relating to the questions as to whether the public necessity and convenience will be served better or not so well by the change of management. The amount of the issue of securities to be authorized if the transfer is made depends upon the value of the property.

A physical valuation is required when there exists no reliable data indicating the present value of the property. It frequently happens, however, that a valuation previously made can be used by making such adjustments as required to give effect to changes that have taken place since such valuation was made. If the valuation was made for some other purpose, it may be modified, if necessary, for purposes of capitalization.

In addition to the question of structural or physical value of property to be acquired thru the purchase of another public-utility plant, business considerations sometimes enter into the determination of the value of property. A property or a certain unit of property for operating purposes may be worth more to one company than to another because of strategic location, the ability of the purchaser to operate it more economically, or other similar considerations.

When stock is issued directly in exchange for property, usually a valuation of such property is desirable, because property acquired in this way is generally not in the form of materials or property having a known market value, but a composite property or group of properties with respect to which there is no available record by which to measure the value.

Values for Capitalization Not Same as for Other Purposes.- A distinction is recognized in Illinois and in many other jurisdictions as between value for capitalization. purchase and sale, and value for rate-making and other purposes.

Value for capitalization and value for purchase and sale are in general approximately the same, but a distinction is made in certain cases in which the commission approved the purchase of utility property at a price greater than it would permit to be permanently capitalized. In such cases it required the amortization, thru charges to income or profit and loss, of the amount that was regarded as being in excess of the amount that should be capitalized.

The amount of expenditures for property against which the issue of securities is permitted is not controlling when the question of value for rate-making purposes with respect to such property is under consideration. In Section 26 of the Illinois Commerce Commission law it is specifically provided that no provision of the Act, or anything done by the commission, shall be construed to imply any validation or approval by the state of past issues, nor that past or future or past and future issues represent actual value of property owned or to be owned by a public utility or the value of such property for rate-making purposes.

At first thought it seems inconsistent that the commission should approve certain actual expenditures for the specific property and permit the issue of stock and bonds thereon and yet not accept the same amount as a basis for rates. For, if any company is permitted to issue and sell to the public its stocks and bonds to acquire certain property for use in the public service, should it not be allowed to earn its interest and dividends on the same value, and must not this be done if the credit of the company is to be maintained? There is merit in these considerations, but a little reflection and study of other factors will show that they are not controlling. Some of the reasons why they are not may be stated in the following:

1. Capitalization is based on actual cost at the time incurred, which is generally referred to in rate proceedings as "orginal cost."

Rate valuation must give consideration to what it would cost to reproduce the property at date of valuation, commonly known as "reproduction cost." Such consideration is required under rulings of the U. S. Supreme Court.

When property has been in service for some years these two bases may differ, both because of change in price levels and because of depreciation.

2. Going value is given consideration in rate cases, but it is not subject to capitalization under the uniform accounting classifications or under laws limiting capitalization to actual expenditures for specified property.

3. Rate value may include property donated or held under lease, altho such property is not subject to capitalization.

Investigation of Accounting for Replacements. - When an application is made to the commission for authority to issue securities for the acquisition of property which takes the place, in whole or in part, of other property, careful attention is given to the accounting with respect to the retired property. It is unlawful for a company to issue new securities to provide for replacements and substitutions. This does not, however, bar the capitalization of such part of a replacement as may be in excess of the original cost of the property replaced. Where the accounting has been carried out in accordance with the rules prescribed in the Uniform Classification of Accounts, the increase in the fixed-capital accounts represents the net additions to property; that is, the cost of the new property less the original cost of that which is retired, and the amount of such net additions is, therefore, the amount for which new securities can be authorized.

In some cases the investigation must go beyond the actual accounting to ascertain whether old structures and equipment no longer fit for operation are allowed to remain on hand without the fact of their disuse having been reflected in the books by writing them out of fixed-capital accounts.

Capitalization in Case of Merger or Consolidation. - The foregoing discussions relate to property acquired by a public-utility corporation by purchase. Where property is acquired by corporate merger or consolidation, there is a difference, not only in the legal processes by which the property is acquired, but there are differences in the method by which the valuation may be established. The provisions of the Illinois law with respect to the jurisdiction of the commission in case of merger or consolidation is as follows:

> "The capitalization of a public utility formed by a merger or consolidation of two or more corporations shall be subject to the approval of the commission, but in no event shall the commission approve a capitalization exceeding the sum of the capital stock of the corporations so consolidated, at the par value thereof, and any additional sum actually paid in cash for improvements; nor shall any contract for consolidation or lease be capitalized in the stock of any corporation whatever; nor shall any corporation hereafter issue any bonds against or as a lien upon any contract for consolidation of merger. In any reorganization of a public utility, resulting from forced sale, or in any other manner, the amount of capitalization, including therein all stocks and stock certificates and bonds, notes and other evidences of indebtedness, shall be such as is authorized by the commission, which, in making its determination, shall not exceed the fair value of the property involved."

Before applying to the commission for authority to issue its securities in connection with a merger or consolidation, the provisions of the general corporation act of the state must be complied with by the applicant. This act prescribes the method by which corporations may be merged. Briefly stated, the procedure is as follows:

The directors of each corporation which desires to merge shall pass an identical resolution, prescribing the terms and conditions of the merger, the mode of carrying it into effect, converting the shares of stock, and other details. Such resolution must be voted upon by the stockholders, and if two-thirds vote in favor of it the merger is authorized. A statement showing the action taken and a copy of the resolution is then filed with the secretary of state.

If the secretary of state finds that such statement, with the accompanying papers, is in comformity with law, he files the papers and issues a certificate of merger or consolidation. The merger or consolidation is then effective, and the merged or consolidated corporations are a single corporation. Following are the principal provisions of the statute regarding rights, duties, assets, liabilities, and issue of securities of the corporation so formed.

> "Such single corporations shall thereupon and thereafter possess all the rights, privileges, immunities, powers, and franchises, as well of a public as a private nature, and all property, real, personal, and mixed, and all debts due on whatever account, as well as for stock subscriptions and all other things in action, of, or belonging to, each of such corporations, and be subject to all the restrictions, liabilities, and duties of each of such corporations so merged or consolidated.

> "All rights of creditors and all liens upon the property of either of such merging or consolidating corporations shall be preserved unimpaired, and all debts, liabilites, and duties of the respective corporations shall henceforth attach to such single corporation, and may be enforced against it to the same extent as if such debts, liabilities, and duties had been incurred or contracted by it. Any action or proceeding pending by or against one of the corporations merged or consolidated may be prosecuted to judgment as if such merger or consolidation had not taken place, or the merged or consolidated corporation may be substituted in its place.

> "When two or more corporations are merged or consolidated, the single corporation shall have power and authority to issue bonds, or other obligations, negotiable or otherwise, and with or without coupons or interest certificates attached. to an amount sufficient, with its capital stock, to provide for all the payments it will be required to make, or obligations it will be required to assume, in order either to effect such merger or consolidation or thereafter to conduct its business. To secure the payments of such bonds and obligations, it shall be lawful to issue shares of stock to such an amount as may be lawful to mortgage its corporate franchises, rights, privileges, and property-real, personal, and mixed-and it shall be necessary to the stockholders of such constituent corporations in exchange or payment for the original shares, in the manner and on the terms specified in the resolutions of merger or consolidation.

Securities Issued for Working Capital. - The statute above quoted does not specifically mention the acquisition of working capital as one of the purposes for which securities may be issued. The commission, however, construes the law as permitting the issue of securities for this purpose. It recognizes that working capital represents property actually used, and as necessary to the business as the capital represented in any other kind of property. A stock of materials must be kept on hand, insurance and certain other classes of expense must be paid in advance, and pay rolls must be met promptly, all of which requires the use of a considerable amount of capital.

Many of the companies that have grown from small beginnings have accumulated from operation the greater part of the working capital used and, therefore, have not issued stocks or bonds for this purpose. This is a conservative policy, and one which it is often wise to pursue, but it is not practicable in all cases. Where conditions warrant the issue of securities for such porposes, there is no good reason for the state prohibiting such action.

Capitalization of Interest during Construction.- The determination of the amount of interest that may be properly capitalized often presents difficulty. It is generally recognized as correct to charge to construction interest on the capital used for construction purposes until the property is ready for operation. The rule contained in the Uniform Classification of Accounts with reference to the inclusion of interest charges in fixed-capital account is as follows:

"When any bonds, notes, or other evidences of indebtedness are sold, or any interest-bearing debt is incurred, for acquisition or construction of plant and equipment, the interest accruing on the part of the debt representing cost of property chargeable to fixed-capital accounts (less interest, if any, allowed on unexpended balances) after such fund becomes available for use and before the receipt or the completion or coming into service of the property so acquired, shall be included in this account.

"When such securities are sold at a premium, the proportion of such premium assignable to the time between date of the actual issuance of the securities and the time when the property acquired or the improvement made becomes available for service, shall be credited to this account.

"This account shall include also such proportion of the discount and expense on long-term debt issued for construction purposes as is equitably assigned to the period between the date of the actual issuance of the securities and the time when the property acquired or the improvement made becomes available for the service for which it is intended. The proportion of discount and expense thus chargeable shall be determined by the ratio between the period prior to the completion or coming into service of the facilities or improvements acquired or constructed and the period of the entire life of the securities issued.

"This account shall also include reasonable charges for interest during the construction period on the accounting company's own funds used temporarily during such period for construction purposes.

"If any securities issued or assumed by the accounting company are sold or exchanged by or for that company for a consideration, the actual money value of which at the time of such sale or exchange is less than the value of the securities at par and the accrued interest thereon, if any, the difference between the money value of the consideration received and the par value of the securities, plus the accrued interest, shall be deemed discount, and in no case (except as provided in the third paragraph of this account) shall discount be included as part of the cost of anything charged in any fixed-capital or investment account prescribed in this classification."

As a general rule, no special difficulties arise in connection with the inclusion of charges of this character in the statement of capital expenditures, for the payment of which stocks or bonds are issued. In some cases, however, it presents a question of some importance.

The nature of some of the questions that arise may be indicated by referring to a particular situation where a company constructing a large water-power plant for electrical-utility purposes installed at the time of the original construction the foundations for a plant of double the generating capacity that was actually provided. This was done on the theory that it was more economical to do this construction work at that time. Ten years have now passed and the foundations have not been used. Considerable discussion was had with the state commission as to how much of the interest charges on this idle investment should be capitalized. The result of the discussion was that capitalization was permitted of interest charges for approximately three years.

Similar questions often arise in connection with the purchase of real estate in advance of the necessity for its use. The solution of such questions depends largely upon the application of a reasonable judgment to the circumstances in each case. There should be no hesitancy about capitalizing such costs so far as they finally result in actual economies in the matter of capital costs. When they do not produce this result, but prove to have been an error of judgment, the disposition of the matter is not to be made by some predetermined rule, but should be dictated by a proper consideration of all factors involved in the situation.

Mortgage Bonds.- Altho plain bonds, debenture bonds, collateral trust bonds, income bonds, real estate mortgages, and some other forms of securities are not infrequently issued by public utilities, the greater part of the loan capital used by operating public utilities is obtained from the issue of bonds secured by a mortgage on physical property. Bonds so secured differ greatly as to their actual security. This difference may be due to a difference in the ratio of bonds to actual value of the property mortgaged, or it may be due to many other factors. Two bonds of the same series issued under the same mortgage have equal claim on the property and income, but two bonds of different companies may each have exactly the same amount of physical property value behind them, but if the business of one company is more stable and its prospects of uninterruptedly earning its interest charges are better, the actual security behind the bond is proportionately greater. It is not practicable to attempt a general classification of bonds with reference to their actual security.

The title of a bond does not always indicate its priority of lien or the extent to which there may be liens against the property ranking ahead of it in their claims on the property. Generally, bonds having first claim on the property and income are designated "first-mortgage bonds." Those having a claim which cannot be satisfied until the claims of bondholders under another mortgage are satisfied are second, third, or fourth mortgage bonds. However, companies usually avoid using the terms "second," "third," or "fourth" in referring to bonds, but adopt some title less suggestive of the fact that there are other bonds ranking ahead of them. Some of the titles commonly used are "first and re-funding mortgage bonds," "consolidated mortgage bonds," "general mortgage bonds," "improvement and re-funding mortgage bonds," "extension and re-funding mortgage bonds," and other titles containing various descriptive or qualifying terms.

The term "first and re-funding" usually implies that the mortgage is a first mortgage on certain property but will not be a first mortgage on all of the property until outstanding bonds having a prior lien have been re-funded. Such mortgages usually provide specifically for issuing thereunder bonds sufficient to retire the outstanding bonds. The bonds having a prior lien may be retired before their maturity if they can be retired on satisfactory terms, but this cannot always be accomplished.

Mortgage or Deed of Trust.- The mortgage securing a bond issue is a contract conveying specific property to a third party designated as "trustee" who holds the title to the property in trust for the purpose of insuring payment of the bonds. As such mortgages create a trust relationship they are frequently called "trust deeds." "deeds of trust," or "trust mortgages." The mortgagor retains full possession of the property unless and until default is made as to compliance with the provisions of the mortgage. Upon discharge of the obligations which the mortgage was created to secure, legal title is again vested in the mortgagor company.

Altho each bond issued under the mortgage constitutes an agreement in itself the bond is also included in the mortgage. The mortgage describes in detail the property given as security for the bonds, defines the company's responsibility with reference to maintenance of the property in good condition, free from other liens that might attach to the property by operation of law, and it also provides the method of procedure in case of failure of the mortgagor to comply with the terms of the mortgage.

Provisions for Fortifying Security of Bonds. - Mortgages usually contain specific provisions intended to insure the maintenance of adequate security for the payment of the bonds and the interest thereon. Some of these provisions are aimed at preserving the property values by providing for maintenance and depreciation or additions to property out of earnings, while others provide for a gradual reduction of the debt. In other cases provisions are made for preserving the relationship between physical values and bonds by limiting future issues of the bonds to a percentage, usually about 75 or 80 per cent, of the money expended for additional property.

Another restriction frequently imposed is to forbid the issue of additional bonds at any time when the net earnings do not bear a certain ratio to the amount required to pay interest on the outstanding bonds. The ratio required usually varies from one and one-half times to two times the interest charges.

In the following summary are enumerated the methods most frequently used for the purpose of maintaining or fortifying the security of mortgage bonds.

1. Reduction of debt thru sinking-fund operation.
2. Reduction of debt by serial maturities.
3. Issue of additional bonds limited to a specified percentage of capital expenditures.
4. Issue of additional bonds limited by ratio of net earnings to interest charges.
5. Requirement as to amounts to be expended for maintenance and depreciation.
6. Guaranty of bonds by another corporation or individual.
7. Provision that bonds shall not be issued beyond the point where total outstanding bonds bear a certain relation to the capital stock.
8. Limitation of the amount of additional bonds to be issued during a specified period.

In other industries a provision much used requires that some specified ratio be maintained between quick assets and current liabilities, but this provision has not been extensively used by public utilities.

Accounting for Sinking Funds. - The accounts needed for recording the operations of sinking funds as provided in the Uniform Classification of Accounts of the National Association of Commissioners are as follows:

No. 123, "Sinking Funds" (balance-sheet account): To include cash and other assets actually set aside and held for purposes provided for in Account 254.

No. 254, "Sinking-Fund Reserves" (balance-sheet account): Represents the accumulated reserve for retirement of outstanding obligations; to be credited with all amounts charged to Accounts 441 and 502 for this purpose.

> No. 425, "Income from Special Funds" (income statement): To be charged with all appropriations of income which are credited to Account 254 and reserved for sinking-fund purposes.
>
> No. 502, "Appropriations to Reserves" (profit and loss account): To be charged with all amounts appropriated from surplus for sinking-fund reserves.

Where the mortgage or trust deed requires that earnings from the sinking fund shall be added to the fund, the classifications of accounts provide for the following entries: Account 123, "Sinking Funds" (balance-sheet asset account) shall be charged and Account 425, "Income from Special Funds" (in the income statement) shall be credited with the amount of the earnings for which a corresponding amount of assets have been placed in such fund. Concurrently, Account 441, "Sinking-Fund Appropriations" (in the income statement) shall be charged and Account 254, "Sinking Fund Reserves" (balance-sheet reserve account) shall be credited with a like amount.

Where bonds of the company's own issue are purchased with moneys belonging to the sinking fund and the mortgage requires that they be held alive, they are carried in the sinking fund at their cost.

When the sinking fund has accomplished its purpose, the accounting therefore, as prescribed in Account 254, referred to above, is as follows:

> "When the debt which the sinking fund is created to redeem matures and the fund has accomplished its purpose, the balance in the reserve shall be charged to this account and credited to profit and loss. If the mortgage or other obligation permits,

> the par value of bonds or other evidences of indebtedness issued or assumed by the accounting company which are reacquired thru the operations of sinking fund, may be charged to this account and credited to profit and loss when and as such bonds or other evidences of indebtedness are acquired."

Operation of Sinking Fund.- The usual operation of the sinking fund requires the company to pay to the trustee under the mortgage a fixed amount each year, or an amount calculated by some method provided in the mortgage. The trustee applies the money to the purchase of the bonds for which the fund is created, at a price not exceeding a certain price stipulated in the mortgage, or if bonds are not offered for sale at or below such price, the trustee may draw by lot for redemption the number of bonds desired at the price at which redeemable, as provided in the mortgage. Some mortgages require that interest be paid into the sinking fund on bonds redeemed and carried in the fund assets, at the same rate as the interest paid on the bonds to the holder thereof before redemption.

The administration of the sinking fund may be left to the corporation or may be placed in the hands of a trustee. The administration by a trustee appears to offer some advantages in the increased confidence of the investor and in removing from the management the opportunity for manipulation of the fund.

The use of the reserve presents a further question. The fund may be used to purchase the securities for the reduction of which it was created, or it may be invested in other bonds or property. It is not an unusual practice temporarily to invest the funds in additions and betterments to the company's own property. The plan of investing the sinking fund in additions and betterments tends to enhance the security back of the bonds and it should produce a higher rate of interest or return than is usually obtainable thru other kinds of investment offering the same degree of security.

The use of sinking-fund bonds for public-utility financing is becoming less common. As the industry becomes more firmly established, investors, recognizing the permanency of the business and its economic importance, do not demand the extra protection supposed to be afforded by a sinking fund. Companies likewise have realized the disadvantage of piecemeal financing which the sinking fund practically enforces. Another very important reason for the discontinuance of the use of sinking-fund bonds is that the operation of a sinking fund creates a condition inconsistent with the accepted policies of regulation. Rates for service as fixed by public-service commissions are presumed to allow no more than a reasonable return on the fair value of the property. If this value corresponds approximately with the amount of securities issued, the earnings will only provide for interest and dividends, with possibly a small margin for surplus, but not any additional amounts sufficient to pay off indebtedness incurred for capital purposes. It is not considered reasonable to ask the users of the service, after they have paid enough in rates to yield a fair return to the investors, to contribute something more for the purpose of repaying part of the capital invested.

Serial Maturities of Bonds.- The same disadvantages that have been observed with reference to the sinking-fund plan attend the operation of the serial-maturities plan of payment. The serial-payment plan, however, is at present used chiefly for the acquisition of units of equipment such as railroad cars and locomotives. There are in this plan of payment some conpensating advantages resulting from the fact that as the loan made on the new equipment (the evidences of which are commonly designated as "equipment-trust certificates" or "car-trust certificates") is a prior lien or first mortgage on the equipment, such certificates are highly regarded by investors. It is, therefore, possible in many cases for a company to obtain capital on such certificates at lower rates of interest than could be obtained on bonds issued under the existing mortgages of the company.

Bonds Issued for Permanent Financing.- Bonds are issued payable at a specified date, the periods for which they have commonly been issued varying from ten to fifty years. Numerous issues have been made for a lesser time, while others have been made for a hundred years or longer. The larger companies at present are as a general rule issuing bonds payable in from thirty to fifty years. The indebtedness, however, whether evidenced by long or short securities, is regarded as permanent. The date at which bonds are made payable, therefore, is not determined with reference to the utility company's ability to pay and discharge the indebtedness, but rather is determined by considerations as to the most practicable means of contracting for its loan capital, The terms that appeal to investors have much to do with matters of this nature.

The problem of the financial management of the company is to secure its capital at as low a rate of interest as possible over a long period of years. When an issue matures and a re-funding issue is made, there is considerable expense involved in drawing new mortgages, obtaining the required authorization, added to which is the discount or selling expense. Long-term issues reduce such costs by making their recurrence less frequent. On the other hand, under conditions sometimes prevailing in the investment markets, investors have a preference for short-term issues, and when this condition exists it may be desirable to make the term of the issue conform to the market demands in order to secure the moneys required at the most satisfactory rates of interest. Special conditions also arise with reference to the company's operations or its financial status which render it necessary or advisable to finance for a time by the issue of short-term bonds or notes.

For some time during and succeeding the World War many of the public-utility companies were not receiving sufficient income to make their bond issues attractive investments, and rather than sell them at the heavy discounts that would have been necessary, such companies chose to issue short-term bonds or notes, often pledging the bonds as security therefor, with a view to placing the bonds on the market when conditions were such as to permit their sale at prices closer to the par value.

Proportion of Stock and Bonds.- Generally speaking, there are no fixed rules regarding the proportion that shall exist as regards the stocks and bonds of a public-utility corporation. However, a few states have statutory limitations, as, for instance, the Massachusetts law, providing that the bonds and other evidences of indebtedness shall not exceed twice the amount of capital stock. From 40 to 50 per cent stock and from 50 to 60 per cent bonds are about the usual proportions issued. Recent compilations show ratios of 44 per cent stock and 56 per cent bonds, these figures being averages for the public utilities of this country. Railroad stocks and bonds show ratios of 43.7 per cent and 56.3 per cent respectively.

In a few instances the capitalization is principally bonds, but in these cases the bonds are guaranteed by an affiliated company or companies, which guarantee affords security based on the credit of the guarantors as well as the security of the physical property. These instances are exceptional, and usually are in connection with a subsidiary company organized to perform an essential service for the guarantors.

An instance of this type of financial structure is found in the Chicago Union Station Company, a corporation organized by four railroad systems using the station, each company owning one-fourth of the capital stock of the station company. In this case the stock amounts to $2,800,000, while the bond issue is $60,000,000. The payment of the interest and principal of the bonds is guaranteed by the various railroad companies who own the stock. Without this guarantee, the bonds would not have a sufficient margin of security to make them acceptable to investors, but with the guarantee of these railroads, the bonds are regarded as among the most desirable of railroad issues.

One of the most successful public-utility managers in this country recently expressed the opinion that a very satisfactory financial structure existed when the value of a property was represented to the extent of 20 to 25 per cent by the reinvestment of surplus and reserves and the balance of 75 to 80 per cent was about equally divided between bonds and capital stock.

The relative proportions of capital to be obtained from the issue of stocks and bonds depends upon the relationship that will produce a well-balanced capital structure, such as will permit the securing of combined bond and stock capital at the lowest average rate. Money can be obtained from the issue of bonds at a rate of interest substantially lower than the rate at which it can be obtained from the issue of stock. The difference in rates, however, depends to a large extent upon the security.

Another factor that may receive consideration with reference to the propositions of stocks and bonds is that the owners and operators of a utility desire to retain control and also to reap the benefits of their skill in management by realizing a liberal return on their stock holdings.

In many cases these objectives may be attained by maintaining a financial structure having a relatively small proportion of stock, the larger part of the capital being obtained from bond issues bearing a rate of interest lower than the dividend rate that will satisfy stockholders.

If a rate of return of, say 7½ per cent,is earned on the total investment, and the property is bonded for one-half the total, with bonds bearing interest at 5 per cent, the remainder of the income after interest charges is equal to 10 per cent on the stock.

The manner in which the division of net income as between bondholders and stockholders is affected by the respective amounts of each class of securities, and the manner in which the rate of interest may in turn be affected by the proportion of bonds and stocks, may be observed in Figure 9, which reflects substantially the capitalization of a certain gas company, round figures being used for convenience in these computations.

Total investment - - - - - - -		$50,000,000
Bonds (int.rate 5%) -	$25,000,000	
Common Stock - - - -	25,000,000	

Company earns 7½ per cent on its investment, which amounts to 10 per cent on the common stock after paying interest at rate of 5 per cent on the bonds. It pays 8 per cent in dividends, retaining the balance in surplus.

After some years of operation, during which considerable development has taken place, the following is shown by the balance sheet.

Total investment - - - - - - - -		$110,000,000
Bonds (int. rate 5%) -	$50,000,000	
Common Stock - - - - -	40,000,000	
Investment of surplus and reserves - - - -	20,000,000	

If the company continues to earn 7½ per cent on its investment and pays 5 per cent interest on its bonds, the remaining net income will amount to 14.37 per cent on the stock. If, on the other hand, the company had paid out all of its surplus in dividends and had financed all of its additions by bond issues, the balance sheet would show the following:

Total investment - - - - - - - -		$110,000,000
Bonds - - - - - - - -	$85,000,000	
Common stock - - - -	25,000,000	

Assuming an earing of 7½ per cent on the entire investment and bond interest at the rate of 5 per cent, there would remain net income amounting to 16 per cent on the common stock. It is, however, not likely that money could be borrowed under these conditions at 5 per cent, as investors would not regard bonds as well secured if issued to cover such a large proportion of the property investment as above indicated.

The last-mentioned proposition seems very desirable from the point of view of the stockholder. However, a comparison of these financial structures, as shown in Figure 11, indicates that this scheme (Item C) is most insecure, because the fixed-interest charges are so much greater and the margin of safety, which is the amount left for the stock, is correspondingly less. In case of any material reduction in the income, the margin of safety may be reduced to a dangerous extent. If in the latter case 6 per cent interest had to be paid on the bonds in order to sell them, the margin of safety would be still less (Item D), and if 7 per cent were required the amount remaining for the stock would be still further reduced (Item E).

A financial structure substantially such as shown in Item B, involving the investment of the surplus and reserves, is usually considered very satisfactory both to bondholder and stockholder.

Simplicity of Financial Structure Desirable. - In the past, utilities have labored under difficulties resulting from a complicated financial structure. A single company sometimes had outstanding from six to ten classes of securities, including its capital shares and instruments evidencing indebtedness in the form of various kinds of mortgage bonds, debenture bonds, equipment-trust certificates, notes, and purchase-money obligations.

Financial structures of this kind often develop as a result of a closed mortgage, limiting the bonds that may be issued under the mortgage to an amount insufficient to cover the capital requirements. When additional loan capital is required,

Comparison of Financial Structures.

Item	Total Investment	Bonds	Stock	Surplus	Net Earnings	Bond	Interest	Income Available for Stock	
					@ 7½%	Rate	Amount	Amount	%
A	$110,000,000	$55,000,000	$55,000,000		$8,250,000	5%	$2,750,000	$5,500,000	10
B	110,000,000	50,000,000	40,000,000	$20,000,000	8,250,000	5%	2,500,000	5,750,000	14.37
C	110,000,000	85,000,000	25,000,000		8,250,000	5%	4,250,000	4,000,000	16
D	110,000,000	85,000,000	25,000,000		8,250,000	5%	5,100,000	3,150,000	12.6
E	110,000,000	85,000,000	25,000,000		8,250,000	5%	6,150,000	2,100,000	8.4

Figure 11 - Comparison of Financial Structures.

In this table an investment amount of $110,000,000 is used in each case, but the same percentage relationship between the stocks and bonds as referred to in the preceding paragraphs is retained.

a second or third mortgage or some other form of financing is resorted to. With such a complex structure the prospective investor finds great difficulty in ascertaining the amount of security behind any given issue, and therefore if he is willing to invest in the company's securities he does so only on terms which will entail upon the company a high cost for the use of the capital. Many of the companies originally financed in the early-development period have already found it necessary to organize on a sounder financial basis, with a financial structure composed principally of first-mortgage bonds, and perhaps preferred stock as well as common stock.

Bankers and financial officers who have a voice in determining under what terms and conditions the securities will be underwritten and sold are now taking a broader view of the situation. More attention is paid to creating conditions which will make for the success and stability of the business. The bankers' zeal to surround a particular issue with numerous limitations and restrictions likely to defeat its own purpose to safeguard its security leads to a short-sighted policy if the result of the restrictive measures is seriously to handicap the company in its development.

Commission Regulation Co-operative. - In matters of finance, commission regulation, if it is to be successful, must be co-operative, and not merely negative, in character. It should not hesitate to place its veto on any proposal that clearly appears to be reckless financing. From time to time commissions are presented with promotional schemes which are so manifestly unsound as to deserve prompt and final rejection, but, as has been indicated by the Supreme Court, the commission it not the financial management of the utility and should not substitute its judgment for that of the company's officers in matters relating to the internal affairs of the business, unless it is clearly within the public interest to exercise the drastic power of regulation conferred by law. This does not mean that the commission should, without reservation, give its approval to financing that appears likely to adversely affect the credit of the company or impair its ability to render proper service at as low a cost as reasonably possible.

Sound principles should be insisted upon, but fixed and arbitrary rules should not be adopted to the extent of interference with the ability of utilities to adjust themselves from time to time to the changing character of the financial markets. There are times when it is inadvisable, if not impossible, to finance additions by the issue of stocks. The type of bond, its maturity and interest rate in particular, should take into consideration the demands of the investing public at the time of issue. Only by consideration of these factors can money be secured on the most satisfactory terms.

Customer Ownership of Securities.- During recent years many public-utility companies have been quite successful in selling shares of their capital stocks to their customers, employes, and others located in the communities in which the companies operate. Usually the subscriptions are payable in installments, thereby permitting persons of moderate means to invest in the stock. The greater part of the securities sold in this manner has been preferred stock.

The plan of selling securities to the investor in the local community has some important advantages aside from the matter of procuring capital. An interest in the company is created among those who are the users of its service. This relationship is an aid in developing and increasing utility business and tends to prevent unreasonable demands upon the company. With a considerable number of stockholders in a community, attempts to enforce demands for lower rates upon a utility do not find as general support as might otherwise be the case. If the customer is a stockholder, he is more inclined to see both sides of the situation.

Some of the larger utility companies have thousands of employes, practically all of whom own securities of the company. This naturally is conducive to the development of a loyal and efficient corps of workers.

Holding Companies.- Our discussion up to this point has related to public-utility operating companies. In the public-utility field holding companies have been developed to an unusual degree and during recent years have so extended their sphere of activities that they now control approximately one-half of the public-utility business of the United States. While this study is not the place for a general discussion of the advantages and disadvantages of holding companies or even for a full statement of their methods of organization and business activities, nevertheless a brief statement is in order with reference to their financing and particularly their relation to the financing of the operating companies.

The special function of the holding company is to own the capital stock of other corporations and by reason of such ownership to control such corporations. The holding company may be solely a holding company, or it may be both a holding company and an operating company. Usually it owns all of the common stock of the companies which it controls, altho there are many cases in which part of the stock is owned by others. But it is essential to the purposes of the holding company that it either own a majority of the shares or that it have sufficient control over shares owned by others to enable it to influence the vote of such shares. Control may be effected with a less number of shares owned or directly controlled if the stock not owned by the holding company is widely scattered so that it cannot be effectively voted as a unit. The holding company frequently owns preferred stock and bonds of its subsidiary companies, the various securities owned by it being generally pledged as collateral security for its own issues of securities.

State regulatory commissions usually have authority to regulate only the issue of securities of the corporations conducting the actual operation of public utilities and have no control over the financing of the corporations owning the stock of the operating companies. The holding company stands in the same relation to the regulatory authorities as does any other stockholder in the corporation and therefore the methods by which such stockholders acquire the funds for the ownership of public utility stocks is beyond the review of regulatory commissions, the same as are the individual stockholders' methods of acquiring stock ownership.

Reader's Test of Subject Matter in Chapter VII

The following questions are given to enable the reader to check himself as to his grasp of the important points discussed under the subject, "Financing Public Utilities."

1. Outline and define the various classes of capital stock, bonds, and other forms of indebtedness in use among public utilities.
2. Can stock of a public utility be sold at a discount?
3. What accounts are provided and how are they constructed to set up bond discount and premium?
4. To what extent has the control of securities been placed under the jurisdiction of state commissions?
5. What are the advantages to a utility in issuing short-term notes?
6. Under what circumstances will the commission make valuation of property for the purpose of a security issue?
7. How may replacements and the accounting for retired property have a bearing on a security issue?
8. Can securities be issued for working capital?
9. What are the provisions for capitalizing interest during construction?
10. Name the provisions in a mortgage intended to insure the maintenance of adequate security for the payment of the bonds and the interest thereon.
11. Explain the operation of the sinking fund and show the advantages and disadvantages of it in financing a public utility.
12. What are the average proportions of stocks and bonds that should exist in a public utility?
13. State how commission regulation should assist and cooperate in financing a public utility.
14. What classes of securities are usually sold to customers and what are the advantages of financing in this manner?

Chapter VIII

ACCOUNTING FOR MUNICIPAL WATER WORKS

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The essential points brought out in this section are briefly summarized in the following:

1. Frequent changes in the administration of municipalities necessitate adequate accounting in municipal waterworks.
2. National Commissioners' classification is applicable to water utilities conducted by municipalities.
3. The New England Water Works Association recommend the use of a classification of accounts for municipal waterworks.
4. A form of operating and income statement is submitted and discussed.
5. Balance-sheet accounts recommended by the New England Water Works Association are presented.

ACCOUNTING FOR MUNICIPAL WATER WORKS

Comparisons with Privately-Owned Water Works. - The accounting for municipal waterworks and the use of adequate accounting methods is no less important than in connection with public utilities owned and operated by provate investors. The public is interested, not only in continued good service at reasonable rates, which constitute its principal interest in public utilities privately financed, but, as it has its money invested in the business, it is further interested in the perpetual maintenance of the property, to the end that the investment may not be dissipated. Information revealing the status of the business depends upon true statements of assets, liabilities, income, and expenditures. These cannot be secured without correct and adequate accounting.

The management of public utilities owned and operated by municipalities is intrusted to public officials elected or appointed for limited terms of office. The fact that there are frequent changes of administration is a special reason for requiring adequate accounting. There is frequently a tendency to make a favorable showing by omitting provision for depreciation or deferring maintenance work, rather than to increase rates for the purpose of obtaining sufficient revenues adequately to maintain the property. All to often do instances appear of a favorable showing of net income which is turned into a deficit when the accounts are properly audited.

In several of the states the public-utility commission having jurisdiction over privately owned utilities is authorized to prescribe uniform accounting methods for municipal waterworks. The uniform classification of accounts, approved by the National Association of Railway and Utilities Commissioners for water utilities is also applicable to water utilities conducted by municipalities. This system includes a few accounts that will not be required under municipal operation. There will also be a few additional accounts required to meet any conditions that may be peculiar to the municipal accounts. The principal differences will be found in the accounts relating to the financing of the business and the disposition of net income.

New England Water Works Association Classification. - The New England Water Works Association, on September 15, 1921, adopted and recommended to its members the use of a classification of accounts for municipal waterworks. This classification was submitted by the association's committee on uniform accounting and was published in the Association Journal for March, 1921.

The reasons for the adoption of this classification of accounts are stated in the resolution of the convention of the New England Water Works Association as follows:

> WHEREAS, at the present time in this country all privately owned and operated public waterworks are universally classed and recognized as public utilities, and as such are amenable to uniform accounting and other operating requirements prescribed by the public-utility commissions of the several states; and
>
> WHEREAS, municipally owned and operated public waterworks are likewise recognized and classed by the best and most competent authorities as public utilities (by some governmental authorities called "public-service enterprises") instead of political subdivisions of municipal government; and in a growing number of states such municipally-owned water utilities are also amenable to similar uniform accounting requirements as are the privately-owned water utilities; - and
>
> WHEREAS, it is an undisputed fact that, in order that the operation of the municipally-owned water utilities may compare favorably with the operation of the privately-owned water utilities, the former will need to adopt more of the efficient and businesslike practices of the latter, one of which is the general use of a uniform accounting classification, such as prescribed by the state public-utility commissions, so that proper and informing comparisons of results may be easily made between such water utilities.

Form of Operating Income and Expense Statement. - The statement of income and profit and loss accounts (including the condensed statement of operating revenues and operating expense accounts) in the above-mentioned classification is as follows:

I. Earnings from sales of water to private consumers $________

II. Less abatements, refunds, etc.... ________ $________

III. Earnings from sales of Water to municipality.
Note: If no payment is made for municipal uses of water, state estimated total value of such uses here ($____) ---not to be included here in revenue total - and give reasons for such nonpayment, classified accounts to be kept of such current uses and charges, and to be charged off at close of year as a bad debt if no payment is to be made.

IV, Earnings from use of water by the waterworks utility itself, and included in its operating charges and expenses........................$________ ________

Total operating revenues (water) $________

OPERATING EXPENSES

V. Source-of-supply expense . . . .$________
VI. Transmission expense . . . . ________
VII. Distribution expense . . . . ________
VIII. Commercial expenses. . . . . ________
IX. General expense . . . . ________
X. Undistributed expense. . . . . ________

(Show separate total of above) . . . $________

XI. Depreciation-reserve charge. . . . . ________
XII. Contingencies (extraordinary). . . . . . . ________
XIII. Taxes. ________

Total operating expenses. . . . . . . ________

Operating profit . . . . $________

XIV. Nonoperating revenues (not water; net profit on mdse. sales, jobbing, rentals, etc.). . . . . ________
$________

Gross income (forward)

DEDUCTIONS FROM GROSS INCOME

XV. Interest on funded debt (net) . . . . . $______
XVI. Interest on floating debt (net) . . . . ______
XVII. Interest on other liabilities (net) . . ______
XVIII. Miscellaneous deductions . . . . ______

Total deductions . . . . ______

*Net income . . . . $______

*Disposition of Net Income. Any payment for dividends, or appropriations for same or to municipal funds, should be deducted, and balance of net income will then be carried to surplus account.

The revenues from private consumers is further subdivided into separate accounts for commercial, industrial, institutional, contractors, and miscellaneous consumers, with separate accounts for metered and unmetered consumers in each of these classes. Further subdivision is made for revenues from water furnished outside the city limits. The account, "Earnings from the Sale of Water to the Municipality," is subdivided, showing separately fire-department use, various schools, and other public buildings.

It will be noted that provision is made for including in the earnings, if desired, amounts to represent water for municipal use. Privately-owned utilities usually receive revenue from hydrant rentals and for water used for various purposes by the municipality, excepting in cases where a certain amount of such service is required of the company without compensation therefor. Where the municipality operates a utility and furnishes itself with water and fire protection without including a charge therefor in the revenue account, computation of the cost of production and distribution for such purposes should be made. This is useful for the purpose of checking waste and for the further purpose of comparing operating cost with that of privately-owned utilities.

The operating-expense account, "Source of Supply Expense," includes not only the expense which the National Association of Railway and Utilities Commissioners include under this head, but also includes pumping and purification expense, which, in the Commissioners' classification, are included in separate divisions. In the transmission, commercial, and general expenses there are little substantial differences in the two classifications, the main difference being in the arrangement or grouping of certain accounts. The Commissioners' classifications contain a larger number of subdivisions than does the classification of the Water Works Association.

Condensed Balance-Sheet Accounts for Self-Supporting Water-Works. - The balance-sheet accounts in the classification recommended by the New England Water Works Association are exhibited in statement form as follows:

UTILITY

(All Accounts on Accrual, not Cash, Basis.)

ASSETS

XIX.	- Plant, property, and equipment (cost basis). . . .192. . (aggregate at date of new accounting)	$.....
XX.	- Additions to plant, property, and equipment (cost basis) since ....192.....(since new accounting..	$.....
	(Showing total cost to date)	$......
XXI.	- Stock and stores	......
XXII.	- Accounts receivable	......

XXIII. - Cash (general current funds) . . . .
XXIV. - Sinking funds . . . .
XXV. - Cash (special funds) . . . .
XXVI. - Miscellaneous current assets . . . .

Total assets. . . . . $........

LIABILITIES

XXVII. - City (or town) of ....equity (capital-investment account) . . . . $........
XXVIII.- Funded debt (bonded obligations . . . .
XXIX. - Mortgage liabilities. . . . .
XXX. - Current liabilities . . . .
XXXI. - Accrued liabilities . . . .
XXXII. - Depreciation reserve . . . .

Reader's Test of Subject Matter in Chapter VIII

The following questions are given to enable the reader to check himself as to his grasp of the important points discussed under the subject,"Accounting for Municipal Waterworks."

1. What are the special reasons why public utilities owned and operated by municipalities should have an adequate accounting system?
2. State three reasons advanced by the New England Water Works Association why the account classification recommended should be adopted by municipally owned and operated water utilities.
3. Compare the forms of income and expense statement and the balance sheet with those for privately owned and operated water utilities as approved by the National Commissioners.

Chapter IX

STATISTICS

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The essential points brought out in this section are briefly summarized in the following:

1. The efficiency of the various operating departments is reflected thru properly prepared statistical reports.
2. The major portion of the statistics required by a utility is essentially accounting work; hence the accounting structure must facilitate the preparation of statistical data.
3. Constant changes in economic conditions affecting investments, the cost and quality of labor and material, and also new inventions, require constant study of the efficiency of operations under varying conditions.
4. A comparative fuel statement such as shown herein is of value in measuring efficiency of the generating station in converting fuel energy into electrical energy.
5. A detailed classification of the electrical energy sold to consumers is illustrated.
6. Form of statistical reports for gas and water utilities approved by the National Association of Railway and Utilities Commissioners are illustrated.
7. Utility operators require a large amount of statistics to efficiently plan and operate the properties.

STATISTICS

Value of Statistics. - A study of public-utility accounting, limited to financial accounting, even tho applying the most approved methods of double-entry bookkeeping for insuring an adequate check on income and expenditures and an accurate determination of net income, would fall far short of giving the student an adequate conception of the demands properly made upon a modern public-utility accounting department. Besides the ordinary financial reports there must be provided data on many phases of the business, so that a definite connection may be established between financial results and the various departments and functions of the enterprise. The degree of efficiency of a multitude of elements involved in production and distribution must be tested and relative values established.

For example, it is possible for a utility to be showing an increase in both its gross and net income over a short period of years and still actually be getting into a worse condition each year. Tho the gross and net income might be increasing as a whole, it is possible that when related to the number of consumers the amount per consumer might be decreasing, and likewise the amount of income per dollar invested in fixed capital might also be decreasing. It is possible that the net income could be increasing year by year over a short period, due to insufficient amounts being charged to operating expenses to cover the retirement loss, which is normally necessary. In such instances a study of the efficiency of the various operating departments would very likely show a falling off in the operating efficiency. The consumption of coal per unit of output might be gradually increasing, due to the company's restricted policy with regard to maintenance and replacement. Likewise, certain operating methods might become less efficient in handling a larger volume of business than they were in handling the smaller volume. There are many such important facts that cannot be disclosed by confining one's study to the statements of income and expense and the balance sheet. For this reason, it is most important that other data be recorded and used in connection with the financial statements, so as to provide means for measuring the success or failure of the enterprise as a whole or of any particular department or function.

Acounting System to Provide for Preparation of Statistics. - Information of this character may be prepared in a section of the accounting department, or a more or less co-ordinate department may be established for the preparation of this data. In any event, the major portion of the statistics required by a utility is essentially accounting work; therefore the accounting system must make very careful provision for the necessary divisions in the accounting structure and for the employment of such forms as will facilitate the preparation of statistical data. The accounting department, or statistical department, as it may be, should have direct supervision of the preparation and assembly of data which is to be furnished by the various other departments. Without such authority the one charged with the preparation of the statistical data may find that his hands are tied.

The position of the public-utility accountant in regard to matters of this nature was described by a certain public-utility accountant in a recent address as follows:

"The accountant of to-day has outgrown the old bookkeeper with his debit and credit system. He must be highly trained. He should be familiar with the laws, both state and Federal, governing public-service corporations. Nearly all of them affect the accounting department in one way or another. He must be able to analyze; he must know his property, and by that I mean he must know every detail of the operations and organization of the property, in order that he may not only record the figures but that he may also know and understand the reasons for those figures."

The demand for statistical data comes principally from three sources:

1. Probably the most important requirements are those of the management.
2. The various regulatory bodies make certain periodical requirements, and also special requests for information at times of special proceedings, such as changes in rate schedules or changes in the capitalization of the utility.
3. There are also certain requirements on the part of the investors in the company's securities which must be provided for.

According to the volume of statistics usually required by these groups they can be rated in the order in which they have been mentioned. The nature of the information required varies considerably.

The demands for stiatistical data for use by the management is constantly increasing. This is the natural result of the development of larger operating units created by consolidation of smaller units and normal growth of the business, which development places the executive officers of the company at a greater distance from the details of the business; consequently a large amount of information, which formerly might have been obtained by the officers of the company by personal observation and inquiry, must now be provided by more elaborate statements and explanatory reports.

Necessity for Study of Operating Efficiency. - Constant changes in economic conditions affecting investments, the cost and quality of labor and material, and also new inventions, have created conditions requiring constant study of the efficiency of operations under various conditions. The wisdom of decisions of utility officers on questions of policy affecting operations, extensions of plant facilities, and financing are likely to bear a close relation to the adequacy of their information. It is not an easy task, even with as full information as can be procured, to plan wisely for future needs, but to attempt to do so with incomplete information is to invite failure.

The statement shown in Figure 12 is an illustration of one kind of statistics that is used by the management of a large electric utility in measuring the efficiency of their generating stations in converting the energy of coal into electrical energy. The amounts shown in this illustration are for all of the generating stations combined, but the company prepares this information for each individual station and it may be compared with as many years as is desired.

Customers' Statistics Report. - The statement shown in Figure 13 is an illustration of certain statistics prepared by the same electric utility showing a detailed classification of the electrical energy sold to its various consumers. Besides statements of this nature,the management requires a large amount of other data. Some of this is similar to the two statements which will be illustrated in the following paragraph dealing with the requirements of regulatory bodies.

COMPARATIVE FUEL STATEMENT.

(This form for both monthly and yearly statements)

MONTH OR YEAR Calender Year 1923

	Year 1923	Year 1922	Compared with 1922.	
			Per Cent Increase	Per Cent Decrease
K.W.H. output, in thousands,	2,495,371	2,132,080	17.0 -	-
Number of tons consumed,	2,787,880	2,416,141	15.4	-
Per cent of crushed coal,	52.1%	64.7%	-	19.5
Price per ton on receiving track,	$4.40	$5.04	-	12.7
Station cost of fuel,	$12,278,862	$12,175,632	0.9	-
Pounds of coal per K.W.H.	2.23#	2.26#	-	1.8
B.T.U. per pound,	10,394	10,506	-	1.5
B.T.U. per K.W.H.,	23,225	23,811	-	2.5
Overall station efficiency $\frac{\text{B.T.U. in electrical output}}{\text{B.T.U. in coal fired}}$	14.7%	14.3%	2.8	-
Cost in cents per K.W.H.	.492c	.571c	-	13.8

Date ____________________

Note: Companies operating two or more generating stations will use a separate line for each station.

FIGURE 12 - Fuel statement measuring the efficiency of the generating stations in converting fuel energy into electrical energy.

CUSTOMERS STATISTICS REPORT
ON
NUMBER OF CUSTOMERS, OUTPUT, AND INCOME

NET
Calendar Year ________ 1923 __

	Number of Customers			Kilowatt Hours Sold			Income			Income per K.W.Hr. Sold	
	This Year	Last Year	Percent Increase	This Year	Last Year	Percent Increase	This Year	Last Year	Percent Increase	This Year	Last Year
GENERAL AND FLAT RATE SERVICE (Retail Light, Heat, & Power)											
Residence — Wright Demand Rate A without Riders	567,378	497,061	14.1	243,037,360	198,876,175	22.2	$ 13,843,589.74	$ 11,901,750.81	16.3	5.70	5.98
Commercial Light and Power — Wright Demand Rate A without Riders	91,939	85,464	7.6	223,326,764	186,452,948	19.8	10,015,773.73	8,649,398.56	15.8	4.49	4.64
Wright Demand Rate A and D with Riders covering Additional Charges Such as Rental of Signs, Fixtures, Posts, Etc.	5,637	4,591	22.8	24,085,868	18,014,752	33.7					
Energy							(1,060,310.93	838,762.62)			
Rental of Appliances							(128,727.21	128,390.92)	23.9	4.94	5.37
Wright Demand Rate A with Riders Covering Discount Such as Employes, etc.	2,242	2,400	*6.6	1,076,091	993,100	8.4	54,057.08	49,742.15	8.7	5.02	5.01
Flat Rate — Rate E — Signs, Fixtures, Posts	1,060	1,331	*18.9	2,206,724	2,369,616	*6.9					
Energy							(90,847.98	112,787.02)			
Rental of Appliances							(80,477.93	100,700.45)	*19.8	7.76	8.90
Commercial Power — Wright Demand — Rate B	16,530	16,312	1.3	75,897,316	67,471,148	12.5					
Energy							(3,615,963.37	3,339,513.63)			
Rental of Appliances							1,906.55	2,273.51)	8.3	4.77	4.95
Heating and Cooking	107	114	*6.1	188,103	167,674	12.2	10,081.29	8,659.38	16.4	5.36	5.17
Miscellaneous Light and Power	13	15	*13.3	648,756	566,029	14.6	17,934.78	15,682.51	14.4	2.76	2.77
TOTAL RETAIL LIGHT AND POWER	684,926	607,288	12.8	570,466,982	474,913,442	20.1					
Energy							($28,708,558.90	$24,916,296.78)			
Rental of Appliances							(211,111.69	231,364.88)	15.0	5.07	5.09
LARGE LIGHT AND POWER SERVICE											
RATE C											
Low Tension 25 and 60 Cycle Alternating Current	750	627	19.6	184,578,459	133,933,504	37.8	$3,572,552.67	$2,963,349.70	30.7	2.10	2.21
Low Tension Direct Current	664	623	6.6	212,891,042	184,647,336	15.3	4,592,898.53	4,035,687.02	13.8	2.16	2.19
Untransformed 25 and 60 Cycle Alternating Current	28	29	* 3.4	154,362,619	140,048,410	10.2	1,442,594.40	1,316,007.18	9.6	.93	.94
Limited Hour Low Tension A.C.	96	86	11.6	38,680,341	29,327,160	31.9	591,156.17	494,254.30	19.6	1.53	1.69
Limited Hour Low Tension A.C. with Refrigeration Rider	70	67	4.5	92,449,116	92,961,746	* .6	907,333.62	897,224.59	1.1	.98	.97
Limited Hour Low Tension Direct Current	50	44	13.6	17,605,294	14,248,509	23.6	335,284.37	282,785.74	18.5	1.90	1.98
Limited Hour Untransformed 25 and 60 Cycle A.C.	4	4	-	37,687,550	6,313,160	497.0	310,062.57	103,707.37	199.0	.82	1.64
Sanitary District	1	-	-	99,600			1,245.00	-	-	1.25	-
Rental of Appliance							$ 19,518.66	$ 16,305.09	21.5	-	-
TOTAL LARGE LIGHT AND POWER SERVICE	1,663	1,480	12.4	738,354,021	601,479,825	22.8	$12,072,745.99	$10,109,320.99	19.4	1.64	1.68
MUNICIPAL LIGHT AND POWER											
Street Lighting	113	96	11.7	1,188,100	1,026,415	15.8	$58,130.05	$57,090.76	1.8	4.89	5.59
Building Lighting	1,222	1,199	1.9	5,349,968	4,519,995	18.4	186,488.39	157,982.83	18.0	3.49	3.50
Power	211	222	*5.0	1,094,166	1,012,184	8.1	38,322.23	36,089.24	6.1	3.50	3.55
Large Light and Power - Rate C	13	12	8.3	67,927.080	66,331,205	2.4	525,376.68	511,101.66	2.8	.77	.77
Sanitary District	1	1	-	3,372,800	3,671,200	*8.1	61,452.00	57,093.45	6.2	1.82	1.55
TOTAL MUNICIPAL LIGHT AND POWER	1,560	1,530	2.0	78,932,114	76,560,999	3.1	$869,749.35	$819,357.94	6.2	1.10	1.07
TOTAL LIGHT AND POWER	688,149	610,298	12.8	1,387,753,117	1,152,954,266	20.4					
Energy							(41,631,435.58	$35,828,670.62)			
Rental of Appliances							(230,730.35	247,669.97)	16.0	3.02	3.13
RAILWAY, ETC.											
Northern Indiana Gas & Electric Co.	1	1	-	22,066,901	4,423,447	398.9	$207,787.66	$73,648.26	182.1	.94	1.66
Public Service Co. of Northern Illinois	1	1	-	77,402,781	69,460,983	11.4	702,296.33	713,801.36	*1.6	.91	1.03
Street and Elevated Railways	3	3		775,159,124	735,246,576	5.4	5,818,021.77	$5,590,113.78	4.1	.75	.75
TOTAL	5	5	-	874,628,806	809,131,006	8.1	$6,728,105.76	$6,377,563.40	5.5	.77	.79
GRAND TOTAL	688,154	610,303	12.8	2,262,381,923	1,962,085,272	15.3	$48,590,271.69	$42,453,903.99	14.5	2.15	2.15

Figure 13—Customers statistics report.

The various public-service commissions require the utilities to submit to them various physical, financial, and statistical data. An annual report is usually required containing fairly complete information regarding the operations for the past year. This report is usually prepared by the accounting department, altho the operating, engineering, and other departments must furnish a considerable part of the data.

Demand for Special Reports. - Due to certain companies operating several states, and because of the general demand for comparative statistics, a demand has arisen for more uniform reports thruout the country. The National Association of Railroad and Utility Commissioners, thru its Committee on Statistics and Accounts of Public Utilities, has held several hearings and conferences in regard to simplifying and making more uniform the reports required by the public-service commissions. Recently this association, thru its committee, has prepared a complete form of annual report, which it has recommended for adoption by the various state commissions. This report form has also been given the approval of the associations representing the electric and gas utilities.

Reports Required by State Commissions. - There is shown in Figure 14 a copy of one of the pages of this report as recommended for electric utilities. This page indicates the principal items of statistics that are required. A copy of a similar page of statistics recommended for the report of gas utilities is shown in Figure 15. For the use of the company's officers it is usually desirable to prepare such information in comparative form, showing the current month compared with the same month of the

STATISTICS OF ELECTRIC PLANT

At End of Year and Operating during Year

Item No.	Item	Number
1-	Manufacturer's rated capacity in K.W. of generators installed-Steam	
2-	" " " " " " " " -Hydro.	
3-	" " " " " " " " -Internal Combustion Eng.	
4-	Number of kilowatt hours generated during year-Steam	
5-	" " " " " " " -Hydro	
6-	" " " " " " " -Internal Comb. Eng.	
7-	Number of kilowatt hours received from other companies	
8-	Total K.W. Hrs. generated and received (items 4-5-6-7)	
9-	H.W. Hrs. delivered at consumers' premises (Sales)	
10-	Maximum #......minute load on plant during year- in kilowatts	
11-	Pounds of coal consumed (including banking) in producing above power (4)	
12-	Average number of pounds of coal consumed per K.W. Hr. generated (11 ÷ 4)	
13-	Pounds of water evaporated per pound coal consumed	
14-	Working pressure of steam in boilers headers	
15-	Average number of degrees Fahrenheit of superheat	
16-	Manufacturer's rated capacity in horsepower of boilers installed	
17-	Square feet heating surface in boilers installed	
18-	Gallons of fuel oil used under boilers	
19-	M. cubic feet of gas used under boilers	
20-	Gallons of oil used in internal-combustion engines	
21-	M. Cubic feet of gas used in internal-combustion engines	

CUSTOMERS AND METERS AT END OF YEAR

Class	No. of Customers	No. of Meters	Remarks
Residential			
Commercial			
Power			
Municipal			
Other public service Corporations			
Total			

Specify kinds of coal used and quantity of each kind-

Specify whether gas used in internal combustion engines is natural or manufactured gas-

Specify number of minutes; a 15-minute load is desired if the respondent's records make it practicable to state the load for such period-

Figure 14 - Statistics of operations for an electric utility.

STATISTICS OF PLANT AT END OF YEAR AND OPERATIONS DURING YEAR --GAS

(If more than one plant or system is operated by the company the particulars for each should be given).

	ITEM		Number
1	- Coal gas made - M.c.f.		
2	- Coal carbonized - tons (2,000 lbs.)		
3	- Average cost per ton coal carbonized		
4	- " yield per lb. of coal carbonized		
5	- Tons of coke made for stock		
6	- Pounds coke made per ton coal carbonized - #5 ÷ #2		
7	- Tar recovered - gallons		
8	- Gallons tar recovered per ton coal carbonized - #7 ÷ #2		
9	- N. H. 3 recovered - pounds		
10	- Lbs. N. H. 3 recovered per ton coal carbonized - #9 ÷ #2		
11	- Water Gas Made - M.c.f.		
12	- Oil used - gallons		
13	- Average cost per gallon oil used		
14	- Gallons oil used per M.c.f. gas made		
15	- Generator fuel used tons - A. Coke - B.Coal		
16	- Average Cost per ton generator fuel - A. Coke		
	B. Coal		
17	- Lbs. Generator fuel used per M. c. f. gas made		
18	- Tar Recovered Gallons		
19	- Gallons Tar recovered per M. c. f. made		
20	- " " " " gallon oil used		
21	- Gas on Hand - 1st of year	M.c.f.	
22	- Coal Gas Made (*........% of Total)	"	
23	- Water Gas Made (*.......% of Total)	"	
24	- Gas Purchases (*........% of Total)	"	
25	- Total to account for	"	
26	- Gas on Hand - end of year	"	
27	- Gas delivered to Mains	"	
28	- Gas Sold	"	
29	- Gas used by company	"	
30	- Gas unaccounted for	"	
31	- % of Gas unaccounted for #30 ÷ #27	"	
32	- Maximum daily output	"	
33	- Minimum daily output	"	
34	- Average daily output		
35	- Maximum calorific value - B.T.U. - at Works		
36	- Minimum " " " "		
37	- Average " " " "		
	(Report blanks for Items 41 to 52 will require more space than here indicated)		
41	- Number, rated capacity, type and location of water gas sets at close of yr-C. F. per 24 hrs.		
42	- Number of coal-gas benches and location at close of year		
43	- Number, type, and size of retorts per bench at close of year		
44	- Rated capacity of coal-gas plants and location at close of year - C. F. per 24 hours		
45	- Number, rated capacity, and location of boiler equipment at close of year - H.P.		
46	- Number, rated capacity, and location of boiler equipment at close of year H.P.		
47	- Number, capacity, and location of distribution holders at close of year - C.F.		
48	- Mileage of mains (transmission and distribution separately by sizes at close of year		
49	- Number of services by sizes at close of year		
50	- Number of meters by sizes at close of year		
51	- Statement of fixed capital installed during the year - by units and sizes		
	" " " " withdrawn " " " " " " " "		

Note. Items 1 to 10 relate to coal gas; 11 to 20, to water gas.

* These percentages should total 100%

Figure 15 - Statistics of operation for a gas utility.

previous year, and the total for the elapsed portion of the current year compared with the same portion of the previous year.

The principal operating statistics which water utilities in Illinois are required to furnish in their Annual reports to the Illinois Commerce Commission are shown in Figure 15.

In Appendix B there will be found the forms for the complete annual report, including statistical data which the Illinois Commerce Commission requires from electric utilities. If the company operates several departments, such as gas or water, separate forms are provided for plant and equipment, operating revenues, operating expenses, statistics, and physical characteristics. The forms for the corporate history, balance sheet, income account, and profit and loss account are the same for electric, gas, and water utilities, but separate forms for both gas and water utilities are furnished by the Commission with reference to the details of plant accounts, operating revenues and expenses, and statistics. Commissions of other states require similar reports from the operating utilities.

In addition to the annual reports, the commissions require other special reports. When a utility desires to issue securities, it must file certain financial statements, including statements showing the purpose for which the money realized from the sale of securities will be used. In proceedings involving the rates for public utility service, the utility is required to furnish the commission a considerable amount of statistics. These are discussed in a section entitled "The Utility-Rate Problem."

The amount of information which must be tabulated and furnished to the investors in a utility varies with the number of the investors and whether they are local people, or reside at a

OPERATING STATISTICS OF WATER UTILITIES

PUMPING STATION DATA

1. Method of pumping,
2. Gallons of water pumped during year:
   By electricity - - (a) low lift,
   (b) intermediate lift,
   (c) high lift (to dist. system),
   By steam power - - (a) low lift,
   (b) intermediate lift,
   (c) high lift (to dist. system),
3. Average daily pumpage to distribution system,
4. Maximum daily pumpage,
5. Date of maximum,
6. Cause of maximum (fire, sewer flushing, etc.),
7. Minimum daily pumpage,
8. Date of minimum,
9. How is pumpage determined (station meter, pump counters, or estimate),
10. Maximum number of hours pumps operated in any one day,
11. Date of maximum operation,
12. Average daily number of hours pumps operated,
13. Total number of hours pumps operated during year,
14. Total number of hours fire pressure maintained,
15. Range of ordinary pressue on mains--pounds,
16. Range of fire pressure on mains--pounds,
17. Low lift pumps:
    (a) Suction head,
    (b) Delivery head,
18. Intermediate pumps:
    (a) Suction head,
    (b) Delivery head,
19. High lift pumps (to dist. system):
    (a) Suction head,
    (b) Delivery head,
20. Average static head on distribution pumps,
21. Gallons of water delivered to mains:
    January,
    February,
    March,
    April,
    May,
    June.
    July,
    August,
    September,
    October,
    November,
    December.
22. Fuel data:
    Kind of coal (screenings, mine run, etc.),
23. Have you R. R. siding?
24. If not, how far is coal hauled?
25. Tons of coal consumed during year,
26. Average cost per ton delivered,
27. Electricity consumed in pumping:

Low lift--kw.hr.,
High lift (to dist. system)--kw.hr.,
Average cost of current per kw.hr.
Total amount of water passed thru consumers' meter during year:

Figure 16 - Operating Statistics of Water Utilities

distance and have no direct knowledge of the operations of the company. The information desired is, of course, approximately the same for both of these classes, but in the first case they will gather the information from actual contact, while in the second case detailed reports must be furnished.

Stockholders and other investors in the company want to know the amount of assets and liabilities, the time when liabilities must be met, and the means of meeting them. They also want to know the amount of moneys received and their source, whether earned from operation, from outside investments, borrowed or received from sale of assets. The source of the earnings is also very important. The amount expended for maintenance and operation is a matter on which the investor should have sufficient details to form some conclusion as to the adequacy of the maintenance of the property and the efficiency of the operating management. He also needs information from which a conclusion can be formed as to the probable future earning power and the stability of the enterprise. He is interested in forecasting the needs for enlarging the property and the amount of funds necessary to make the enlargements.

A satisfactory system of accounts and records must meet all three classes of requirements as above indicated. It is therefore well for the student as well as for the accountant engaged in the keeping of accounts to keep steadfastly in view the interests of the groups above mentioned.

It has already been mentioned that utility operators require a large amount of statistics in order efficiently to plan and operate the properties. Numerous decisions of public-service commissions indicate that utilities that have proven to be efficiently operated have been rewarded therefore thru an allowance of a higher rate of return than otherwise would have been allowed. In some cases a rate of return lower than the average has been allowed, on the ground that the operations were not efficiently conducted. It is, therefore, apparent that reliable statistics and the consistent use thereof by utilities are very important.

Reader's Test of Subject Matter in Chapter IX

The following questions are given to enable the reader to check himself as to his grasp of the important points discussed under the subject, "Statistics."

1. Outline briefly at least three reasons why statistics are valuable in public-utility operations.
2. Name three sources from which the demand for statistical data comes.
3. What uses may be made of the customers' statistics report shown in Figure 12?
4. What are the advantages of having uniform reports?
5. Outline the various reports required by state commissions.

CHAPTER X

ACCOUNTING METHODS AND PROCEDURE

....

The essential points brought out in this section are briefly summarized in the following:

1. Public utilities are generally owned and operated by corporations organized for profit by private investors
2. Plan of organization and the duties of officers must vary with conditions, and personnel of members.
3. The principal books of account are; journals, cash records, voucher register, general ledger, customers' ledger, operation and maintenance ledger, and investment ledger.
4. The principal forms necessary to account for sales of gas, water, or electric energy are; meter-reading cards, consumers' bills, and consumers' ledger.
5. A system of combined billing and ledger posting as applied to customers' accounts is explained and a saving of time and cost is indicated.
6. A system of time reports and pay-roll accounting is described.
7. Accounting for cash receipts and disbursements is explained.
8. Forms and methods for recording original cost of fixed capital are indicated.
9. Removal of the original cost of retired property from the fixed-capital account must be made by the use of records that will show the proper information.
10. A system of stores records is explained.

ACCOUNTING METHODS AND PROCEDURE

Scope of Accounting Procedure.- It is not the purpose of of this treatise to lay out a complete accounting system for electric, gas, or water utilities. In fact, the routine procedure differs in various organizations, depending upon the personnel and the manner in which the organization has been developed and controlled. It is important, however, to point out certain phases of accounting procedure peculiar to utility companies of this class.

Form of Organization.- Public utilities are generally owned and operated by corporations organized for profit by private investors. A few public utilities are operated by private individuals, partnerships, or associations. A considerable number of utilities furnishing water for fire protection and general use within municipal boundaries, and a few furnishing street railway or electric light and power service, are owned and operated by municipal governments, under a plan of public ownership and operation. In rare cases the properties rendering public-utility service are owned by private investors and operated by municipal authorities. There are also instances of public ownership with private operation. Practically all electricity and gas is distributed and sold by public utilities owned and operated by corporations. The investment in these corporations varies from a few thousand to a half billion dollars.

The same general system of accounts is applicable to this entire range, from the smallest to the largest public-utility investment. This adaptability of the same accounting system is obtained by a condensation of many of the primary accounts for the use of the smaller companies. For the use of the larger companies, the primary accounts may be further subdivided, so that a more comprehensive schedule and elaboration of cost data is obtained.

Likewise, the plan of organization and the duties of the officers will vary greatly. This variation is due principally to the fact that the larger the business the greater the necessity for a subdivision of functions, by which certain executives and officers may become specialists in a particular field.

The organization chart shown in Figure 16 represents an electric utility in the state of Illinois. It is typical of the more common form of organization, and indicates in a general way the division of duties.

It must not be assumed that similar titles in different organizations always carry exactly similar duties; for instance, the title "vice-president," "general manager," or "general superintendent" in one organization may cover duties quite a little different in some respects from those performed by officers carrying similar titles in other organizations. In practically every organization the duties assigned to particular officers are inclined to shift more or less in recognition of special aptitude of certain officers for the discharge of particular duties and similar considerations.

Books of Account, Records, and Forms. - Practically all public-service commissions require that the bookkeeping of public utilities shall be kept by the double-entry method, except

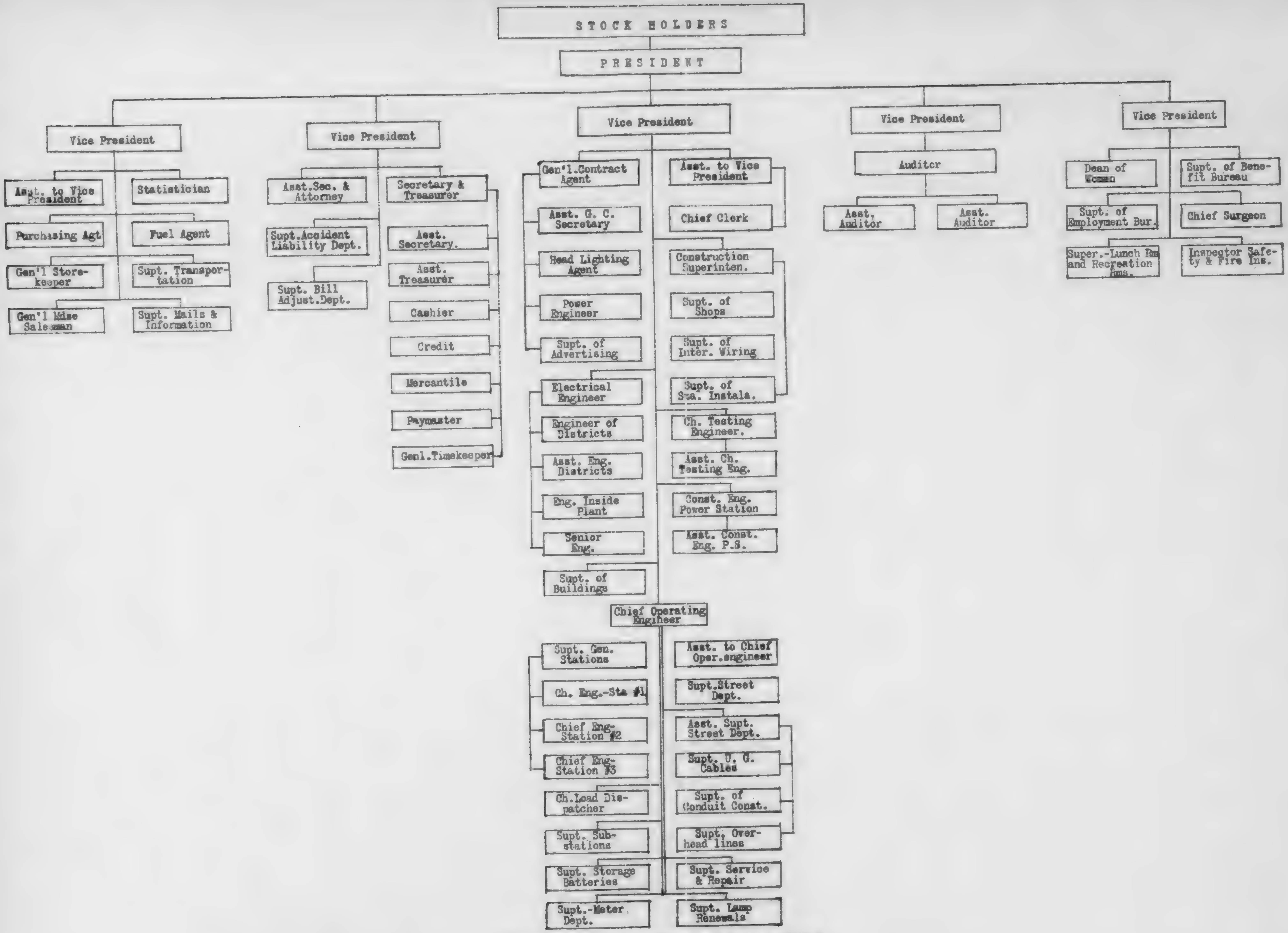

FIGURE 17 - ORGANIZATION CHART OF AN ELECTRIC UTILITY

statistical accounts. The utilities are required to keep general accounting books and other books of record, such as minute books, which may be useful in developing the history of transactions. The utilities in many states have no authority to destroy records unless the rules of the commissions allow such destructions after a specified time.

In electric, gas, and water utilities the principal books of account are:

1. Journals.
2. Cash records.
3. Voucher register.
4. General ledger.
5. Customers' ledger.
6. Operation and maintenance register.
7. Investment ledger.

Journals.- The simple form of journal is still being used by many utilities, especially for recording entries which only affect the general ledger, and for the purpose of summarizing the entries made in subsidiary records. It has, to some extent, been superseded by the use of journal vouchers and other columnar distribution books, which, of course, are only other forms of journals.

Most of the utility-accounting systems of to-day include the journal voucher, but its use differs considerably in the various companies. However, the principal purposes in all cases are to furnish the bookkeeper with proper authority for making each entry, and to place the responsibility for the entries on the officers or employes in charge of the various departments.

Only one illustration of a journal voucher is submitted in Form 1, as the variations in other forms are of a minor character. The journal voucher is used in various ways, among which the following three uses are the most common:

1. All entries which affect the subledgers are entered in a columnar petty journal, where both debit and credit columns have been provided for each account which is reasonably active. All entries which affect only the general ledger are entered in the general journal.

2. In this case all of the journal entries are posted individually to the accounts in the subledgers, which contain all accounts that are not in the nature of summary accounts (such as Account 401, Operating Revenues, and 101, Fixed Capital). These entries are not posted to the general ledger, but at the end of each month a summary is made of the net changes during the month in the various accounts in the subledgers, and these net changes form the basis of an entry in the general journal, which is in the usual form, from whence they are posted to the general ledger.

3. In this case the journal vouchers are posted direct to both the general ledger and the subledgers and constitute the only journal in use.

    These journal vouchers should be retained as a part of the company's permanent records. The best way to preserve them is to have them bound in volumes of convenient size.

Voucher System.- The voucher system of public utilities does not differ materially from the voucher system of companies engaged in other kinds of business, with the exception of the extent to which the distribution is carried. All expenditures of public utilities must be distributed to the various accounts prescribed by the public-service commission under the rules of which it operates. In many instances a utility will operate in several localities, which makes it desirable and in some cases necessary to further subdivide every account by geographical divisions. In many of the larger companies the officers have chosen to make still further subdivisions of the accounts prescribed by the public-service commission. This indicates briefly the great extent to which the distribution must be carried. Frequently it is not practicable to design a voucher register with a sufficient number of columns to provide for all accounts. For this reason a simple columnar sheet is sometimes used to supplement the voucher register, and all of the vouchers are distributed to the various accounts thereon.

The particular electric utility sometimes referred to herein uses a voucher register having nineteen columns for the distribution of the charges. The totals of these columns furnish the entries to be made in the control accounts, while each voucher is also posted directly to the primary accounts in the subledgers. The results under this method are very satisfactory.

General Ledger. - The general ledger as kept by public utilities does not differ from the general ledger of most other concerns. The only question that might arise would be as to what accounts should be kept in the general ledger and what accounts should be kept in subsidiary ledgers. It has been found to be good practice to keep in the general ledger those accounts which are defined as "balance-sheet accounts," "income accounts," and "profit and loss accounts." Separate subsidiary ledgers should be provided for the fixed-capital accounts, the operating-revenue accounts, and the operating-expense accounts, these being represented in the general ledger by their respective controlling accounts.

Accounting for Sales - The principal forms necessary to account for sales of gas, water, or electric energy are:

1. Meter-reading cards or records.
2. Consumers' bills.
3. Consumers' ledger.

Meter-Reading Cards. - The first form which comes into use in connection with the recording and billing of the service rendered each consumer is the meter-reading card or record. Two copies of such form are shown in Forms 2 and 3, Form 2 being for electric utilities and Form 3 for gas utilities. The form for water utilities is similar to Form 3, with information provided for water instead of gas. These meter-reading cards are bound in a loose-leaf binder and are arranged according to certain groups, so that the meter reader may follow the order of these cards and be sure of reading all of the meters on a given street while he is working in that locality. Where the same utility operates both a gas and electric department, the meter-reading cards for electricity, gas, or water can be placed together in the same route book. The only information filled in by the meter reader is that called for in the first three columns, namely, his name or number, the date, and the meter reading. The information called for in the other columns is filled in at the office after the cards are turned in.

Consumers' Bill and Ledger.- The next important forms are the consumers' bill and the consumers' ledger page. Many methods and forms have been tried by utilities in order to save time and labor and prevent errors in billing. The most progressive utilities have adopted some means by which the consumers' bill and the consumers' ledger account are made at one writing. To illustrate this plan, an electric-light bill, consumers' ledger page, and a recapitulation of sales sheet of an electric utility are shown in Forms 4, 5, and 6, as they are placed for recording the information by the use of an Elliott-Fisher billing machine. In this case both the ledger page and the recapitulation of sales sheet must contain the identical figures shown on the consumers' bill, because they are all made at one writing by means of two rolls of carbon paper, the consumers' bill being the original.

Billing by Machine Compared with Billing by Hand. - A system of combined billing and ledger posting as applied to customers' accounts has been adopted by a number of electric light and power companies.

In the case referred to above, the city is divided into four districts, each district being subdivided into twenty-six sections, so as to lay out a given territory to be covered during each of the usual twenty-six meter-reading days. The customers' accounts are arranged on loose-leaf ledgers in alphabetical order as to street, and then numerically as to street number, to correspond with meter-reading books, to facilitate machine posting.

Under the old system of billing, one clerk posted the meter reading to the ledger, another clerk extended the ledger, and still another made out the bills by long hand. These bills were then taken to an adding machine and a list made of the net amounts of the bills. The ledgers were then turned over to another department to draw off the kilowatt hours and the net bill, to check extension, and obtain data for revenue reports.

Machine-Billing Routine. - The meter cards are turned over to a figuring clerk, who computes the consumption for each consumer. By doing this work before the meter cards go to the machine biller, errors in figuring the base are almost entirely eliminated, and much of the time generally taken for making out corrected bills is saved. The current month's consumption is compared with that of the preceding month's, and where an abnormally high or low consumption is disclosed the account is held out and an "investigation order" is issued. This precaution eliminates many errors before the bills are rendered.

The meter cards are then sent to the work dispatchers of the customers' accounts department of the respective districts, who assign them to the machine operators. The operator then places a recapitaluation of sales sheet (see Form 6) in the machine and heads it with name of the operator and any other information for identification. This sheet is inserted under the bottom carbon of the machine, where it remains accumulating all the postings until it is full, or to the end of the run if there are not enough postings to fill the sheet. The operator then places the ledger page (see Form 5) between the two rolls of carbon paper in the proper aligning position.

The bills have previously been addressed and dated (showing date of bill, meter-reading dates and discount date) in one operation by means of an addressograph machine equipped with a special dating device. As the addressograph plates are filed in the same order as the ledger accounts, the bills will be in the right order for the billing and posting operation.

The operator then places the bill (see Form 4) corresponding to the meter card and ledger page on top of the upper carbon, and is then ready to bill the account and post in the following order:

1. Date of present reading obtained from meter-reading card. This date appears on the ledger sheet only, a tape being placed in the machine, which prevents it copying either on the bill or "recap."

2. Present reading obtained from the meter-reading card.

3. Previous reading obtained from the meter-reading card.

4. Consumption cumputed automatically by the billing machine. This difference must agree with the consumption figure filled in on the reading slip by the meter department, and when typed on the bill the amount remains in the cross-footer register to be automatically distributed to the three rate columns. Where the constant is other than one, special rules have been worked out whereby the machine operator bills such accounts very accurately.

5. Consumption at the first rate is obtained from the meter-reading card.

6. Consumption at the second rate is the same as the first rate when the total consumption is greater than two times the consumption at the first rate.

7. Consumption at the third rate is the amount remaining in the cross-footer and is automatically obtained, being that portion of the total consumption remaining after deducting two times the consumption at the first rate.

8. Gross bill is mentally calculated by the machine operator, using a short formula of multiplying the total consumption by a constant and adding it to the consumption at first rate, which is multiplied by a constant. Operators are taught rapid mental calculation at their instruction classes, and extend 75 per cent of the bills mentally. The gross bill also registers in the cross-footer register.

9. Cash discount is then typed on the bill, which is figured by the operator.

10. Net bill is the result left in the cross-footer, which, after being typed, clears the cross-footer and checks the entire operation. The entry of gross bill, discount, and net bill is repeated on the cashier's stub of the bill. The star check key is used to indicate to the operator the following month that the next line is the proper line to post to in the ledgers.

11. Street and house number are written at the extreme right of Form 6 in order to identify the line entry with the proper ledger account.

12. If the customer is a commercial customer, a "C" is typed after the address. Also, the operator types in a symbol for rate schedule if this should be other than the regular schedule, which with this company covers about 80 per cent of the customers. The next posting follows exactly the same routine, and so on until that ledger is billed or the end of the revenue sheet, Form 6, reached. At the end of the run the operator copies the columnar totals from the machine upon the revenue sheet, Form 6, and passes the revenue sheet and bills to the checking division.

In the checking division, the checkers first prove the consumption. The total consumption shown on Form 6 must equal the difference between the present and previous readings. Likewise the sum of the three rate-column totals must equal the total consumption. Net rates are then applied to each of the three rate columns. The total should equal the total of the net bill column, making addition or deduction for minimum charges, rental charges, or discount for accounts billed at rates other than the regular schedule as indicated on the revenue sheet. By checking per revenue sheet, 30 to 40 postings are checked at one time in perfect work. It is seldom that work is imperfect on any sheet. In cases where totals do not check, the checker goes over individual accounts on revenue sheet and locates the error. The erroneous entry is ruled off and the correct figures written in. The incorrect bill and the ledger are corrected by the checker and each correction is again checked by the work dispatcher.

After the rate checker has checked the total on revenue sheets, these are turned over to a clerk who operates an adding typewriter and draws off all special billing, classifying same by rates, and commercial customers (see Figure 13 in Part VIII), showing number of customers, kilowatt hours, amount at first rate, amount at third rate, net bill and excess, if any; and also makes a total summary of revenue sheets.

The subtract key is then set on the machine, and as each rate is redrawn off by the process of elimination, we obtain the data on residence billing, which is the difference between the total summaries and special billing. Check is again applied to these figures by the rate checkers, and this record turned over to the statistical department to make up reports on customers' accounts, as is shown in Figure 18.

You will note that Form 6 is perforated. One half goes to the auditing department, where it is entered, and accumulation totals are checked during the month with the statistical department and are used for the general balance sheet. The other half is used as the control for the balancing of customers' ledgers.

While the rate checker is checking the revenue sheet, the bills are being compared with the ledger by another clerk for name, address, meter number, reading dates, and whether customer has any special billing instruction which the machine biller may have overlooked. All corrections on bills are made by typewriter.

The bills are then turned over to the bookkeeper, who adds to

WESTERN DISTRICT 15-C

P.S. F.S.

	Customers	KW-Hrs.	First Rate	Third Rate	Net Bill	Excess	Minimum Customers.
	SPECIAL LIGHT-EMPLOYE'S RATE						
	1	26	26		$ 1.30	$ 1.04	
	1	17	17		.85	.68	
	2	43	43		$ 2.15	$ 1.72	
	COMMERCIAL LIGHT						
	1	46	16	14	$ 2.66		
	1	23	09	05	1.41		
	1	31	31		2.79		
	1	14	13		1.22		
	1	32	11	10	1.84		
	1	33	11	11	1.87		
	1	11	11		.99		
	1	33	13	07	2.03		
	1	54	31	10	3.74		
	1	10	08		.82		
	1	25	25		2.25		
	1	0	0		.50	$.50	
	12	312	179	57	$ 22.12	$.50	
	TOTAL SUMMARY						
	44	1149	559	279	$ 74.23		
	44	1191	571	231	76.96	$.23	1
	44	979	510	138	65.91		
	44	1136	485	319	70.46	.64	2
	44	1188	567	213	77.87	.05	1
	9	233	74	94	12.78	.05	1
	229	5876	2766	1274	$378.21	$.97	5
St. Lt.Emp.	2	43	43		$ 2.15	$1.72	
Min. Com.	1					.50	
Com. Light	11	312	179	57	22.12		
Min. Res.	4					.47	
	211	5521	2544	1217	$353.94		

Sheet No.
Day No. 15-C
Dist. No. Western
Month March
Date 3-27-20
A 118

Figure 18 - Reports on customers by districts

the bill any previous past-due amounts, service-repair, lamp-renewal, or deferred-payment charges. Service-repair and lamp-renewal charges are carried on customers' ledger sheet. The bills are then sent to the bill-delivery division to be sent out to the customer.

Another form of consumers' ledger which has been used extensively in the past, but which, to a large extent, has been superseded, is the progressive or Boston-style ledger. This form contained columns at the left-hand side of the page in which the names of the customers were listed, together with certain other important data, such as the address, the location of meter, meter number, date the meter was installed, etc., and contained a series of columns for the recording, for each month of the year, the amount of service rendered, the amount billed, the amount paid, and the balance in the account, and any other data desired. This style has proved to be very difficult and cumbersome to handle, especially in territories where there is considerable growth and many new consumers are taken on or where there is a large percentage of renters who move from place to place at frequent intervals. Besides these objections, all entries must be made by hand and the duplicate billing system cannot be used.

Record of Consumers' Deposits. - A utility often requires its customers to make a cash deposit as security for the payment of the charges for services rendered. Interest is paid to the customers on these deposits. To provide for the accounting of customers' deposits, a deposit receipt (Form 7) and a deposit record (Form 8) are used.

Operating Ledger. - The operating and maintenance expense accounts may be conveniently kept by the use of bookkeeping machines. The form of operating ledger shown in Form 9 is made up in duplicate, so that the duplicate copy can be sent to the department head in charge of this expenditure. This form is used for each individual operating account or subaccount, and also for each individual work order which is chargeable to some one of these operating accounts or subaccounts. In order to get the total charges to any one subaccount for any one month, it may be necessary to take the total of anywhere from 2 to 100 ledger sheets for work orders chargeable to this subaccount. The same is true of the main account. Separate columns are provided in order to classify the entries according to the source from which the information is taken.

The posting of charges for material is made direct from the individual supply tickets. The vouchers, including pay-roll for which one monthly voucher is prepared, are posted individually from the voucher register. The journal entries are posted individually from each journal-entry voucher.

In order to insure accuracy in posting supply tickets, vouchers, and journal entries are posted by hand to each account as listed on an analysis form. This practically duplicates the work of posting to individual accounts, but it furnishes a check on the accuracy of the posting. This analysis sheet is usually completed before the operator has been able to complete her ledger postings, and therefore it makes the detailed figures available for monthly statements at an earlier date. Any errors that are discovered later are corrected by journal entry in the following month.

Besides this check, the totals of the supply-ticket debits and credits to all operating expense accounts in the operating ledger are checked with a summary of supply requisitions. The charges for pay rolls are accumulated and checked with the total amount chargeable to operating expense as shown on the pay-roll. In a similar manner the totals of voucher charges and debit and credit journal entries are checked with totals in the voucher register and the journal to insure accuracy in recording transactions.

Time Reports and Pay Rolls, Medium-Sized Utility. - In most medium-sized utility companies the chief engineer, the superintendent, and the office manager usually are responsible for reporting all employes' time. This is usually done on daily time reports, as shown in Form 10. These daily reports are then summarized on Form 11. The one making up the summary of daily time reports must exercise his own judgment as to how many names he can list on each sheet. This form is printed on both sides and is devised for a semi-monthly pay-roll, the last half of the month being recorded on the opposite side of the sheet. The lines are far apart, to allow room for interlining. On the first and sixteenth of each month the totals and distribution are taken off this summary sheet, and the regular pay roll, as shown in Form 12, is made up and attached to the voucher covering the amount of the pay-roll. If payment is made by checks, these are also made, and then voucher and checks are passed to the proper officials for signature and approval.

Time Reports and Payrolls, Large Utility. - The following forms and comments illustrate methods used by the larger utilities, which desire more detailed information. The particular utility using these forms has a monthly pay-roll exceeding one million dollars.

Outside Employes. - In the case of outside employes working under the direction of a foreman, and possibly in a few other cases, such as a gang of carpenters, the foreman is responsible for the correct reporting of the time worked by each employe, together with the proper distribution of his time. He does this on daily labor reports, such as the one shown in Form 13. When these are received at the timekeeper's office they are filed according to employes, so that at the end of each pay-roll period all of the daily labor reports for each employe will be in the same file. The total of the time worked in each payroll period as shown by these daily labor reports forms the basis for the amount which is paid the employe.

The distribution of an employe's time according to the work on which he was employed is summarized as follows: Every four or five days a comptometer operator summarizes the charges for those particular four or five days and shows this summary in the last column, headed," Timekeeper only," on the most recent daily labor report then in the office. The summary for the second four or five day period will include the amounts shown in the first, and so on, so that the last summary at the close of the pay-roll period will contain the full distribution for the whole period. At the close of the pay-roll period these daily labor reports are turned over to clerks who draw off the charges by accounts on certain columnar ruled sheets, using one column for each account. Separate sheets are made up for each department, and within each department certain groupings of accounts are maintained. The purpose of all of this separation into departments and groups of accounts charged is to enable the ready location of any errors that may be made in the various postings.

Inside Employes on Hourly Rate. - This class represents principally men engaged at the various power houses and substations. Most of these men have work which is fairly well established as to the account which is chargeable with their pay and have fairly regular hours. For this reason the time-clock system is used for keeping their time. These time cards show the account to which the employes' wages should be charged and furnish the basis for the entry on the pay-roll of the amounts due them.

General Office Employes and Other Monthly-Rate Employes. - Most of the employes on the monthly-rate pay-roll do not punch the time clock, but are paid their monthly wage, based upon the original authority of inclusion on the pay-roll. Any reductions because of absence or other causes is handled in a special way. The monthly-rate pay-roll employee card, (Form 14), besides furnishing the office record of the authorized rate, is also the source of information for making up the monthly pay-roll and the distribution of pay-roll charges.

Distribution of Charges and Balancing of Pay-Rolls. - After the charges have been distributed to the various accounts, work orders or other classifications on the distribution sheet, covering the whole pay-roll period of half a month, a comptometer operator makes a summary of the total charges for each department and classifies this by certain main groupings, which are considered as controlling accounts, one of these being "account numbers", another "work orders", etc. The total of these distribution sheets for any one department must agree with the total of the pay-roll sheets for that department.

At the end of each pay-roll period these distribution sheets are turned over to clerks who post the charges on certain ledger pages by means of Burroughs Duplex Posting Machines. The posting clerk will post to the individual accounts all of the charges affecting accounts designated by standard numbers, while the machine accumulates the grand total of such charges, which total he transfers to a control ledger sheet of the same form bearing the title "account numbers". In a similar manner he posts all charges to work orders on individual work-order ledger sheets and accumulates the total of such charges, which he posts on the "work-order" control ledger sheet. In this manner a complete check is had of the posting done by this clerk, in that the total figure which he posts to the control sheet for any one department must agree with the summary on the distribution of pay-roll sheet for that department, which summary was made by a comptometer operator and has been balanced with the pay-roll showing the amounts actually paid. By this method it is very easy to locate discrepancies, as they can readily be allocated to a certain group of accounts and to a certain department pay-roll, thereby eliminating the necessity of hunting through the pay-rolls of all departments.

After all of the labor charges for the entire month have been posted to the ledger page, a summary is made of the totals charged to each account, work order, or other classification, in detail, which summary is forwarded to the auditing department. This forms the basis for the entry in the general ledger and subledgers, covering all pay-roll charges.

Pay-roll.- The pay-roll or register of checks (Form 15) is prepared by the timekeeper. He fills in the name of payee, rate, petty-cash outlay to be refunded employe, and total amount due him. The check numbers are filled in by the paymaster. In the case of monthly-rate employes, the reports of petty-cash disbursements are not received until after the salary has been paid. Therefore, in those cases a separate check is made out for the petty-cash items.

When the pay-roll has been received by the paymaster, he first checks any items appearing on the pay-roll, which have already been paid, due to employes leaving the company's service, going on vacation, or for any other reason, and indicates in the column headed "pay-check number" the number of any such pay checks that have already been issued. He also checks his records with regard to any merchandise charges or loans made by employes which should be deducted from the pay check. After having done this, the pay checks are prepared. The payee's name and address and the period for which the payment is made are inserted by means of an addressograph machine. The amount to be paid is inserted by means of check-writing machines, and the signatures are affixed by means of signograph machines. After the checks have been prepared and have been balanced against the pay-roll sheets, they are distributed by the pay-roll department, or, in some cases, sent through the U. S. mails. These pay checks are regular bank checks, and are not ordinarily payable by the company's cashier. All of these checks become void after a period of 90 days, so that any checks that are not cashed within the 90-day period are transferred from the pay-roll account to the unclaimed pay-roll account. Any employee who does not cash his check within the 90-day period must come to the office and receive a new check.

Cash Receipts.- In a large utility serving the residents of a large city the cash receipts come in thru a large number of mediums. The utility may have district offices which collect bills. Some bills are paid to the various tellers at the main office; a great number are paid by check sent through the U. S. mail; some are paid to collectors who are sent to collect overdue accounts; some are paid thru other agencies, such as electric-appliance stores, or other business houses with whom arrangements have been made to accept payment of the utility's monthly bill. In a case of this kind there are a great number of accounting forms necessary for the purpose of properly assembling and reporting the collections to the cashier.

The cashier's department first summarizes and balances the bill stubs with the cash received, according to these various mediums of collection, so as to allocate errors before the funds and the bill stubs of the various collection mediums are combined. After this has been done, the checks and cash are listed and made ready for depositing in the banks. The bill stubs up to this time have been sorted in accordance with the various districts and mediums of collection. They are now sorted according to the customer's ledger arrangement and street address. These stubs are then listed on certain "cash receipts" sheets (Form 16), in order, according to ledger number and under each ledger in the order of street address. This is the final daily cash-receipt record, a summary of which is entered in the cashbook. A copy of these individual sheets, together with the bill stubs, is sent to the accounts-receivable bookkeeper to make the proper credit entries for the payments made. The only amount listed by the cashier's department on these "cash receipts" forms is the total cash received from each customer, which amount is shown in the "amount" column. The bookkeeper, however, makes use of the other columns as an aid in balancing his ledgers.

The general cash-receipts book may be designed to suit the needs or desires of the particular utility. The utility using the other forms shown herein has provided columns in its cash-receipts book for merchandise account, employes' ledger, line extensions, meter deposits, company's stock sales, and consumers' light and power accounts, according to districts.

Cash Disbursements.- The electric utility, some of whose forms have been illustrated herein, uses a standard form of voucher check with a duplicate office voucher. When the original voucher has been properly approved, it is sent to the treasurer for payment. The check is prepared in his office. The date and name of the paying bank is entered on the check by means of a rubber stamp. The name of the payee and the amount (in numerals) is written in by means of an Elliott-Fisher Billing Machine. By means of carbon paper these two items are copied on the bank register, (Form 17) in the same operation. The operator at this time runs the machine beyond the end of the check and enters in the bank register the voucher number, check number (one series for each bank), and in the proper bank column repeats the amount of the check. As a separate operation, the operator, using the same machine, inserts on the check, the check number, address of payee, dollar mark, and decimal point. The amount payable is also written out in full by means of a check-writing machine.

Work-Order Ledger. - The investment-ledger sheet shown in Form 18 is used for the purpose of accumulating the various charges made to each work order which will be finally included in the fixed-capital account. The method of posting to this ledger sheet is the same as was explained for the operating ledger. This record of the total cost to date of each work order is filed according to fixed-capital-account numbers and for each account they are filed by work-order number. The controlling account in the general ledger which covers this class of fixed capital under construction is, for electric utilities, Account No. 359, "Unfinished Construction". When a job has been completed and all of the charges to that work order have been recorded, a journal entry is made transferring the total amount from the unfinished-construction account to the particular fixed-capital account that should be charged with the expenditure.

Fixed-Capital-Accounts Ledger. - The form shown in Form 19, entitled, "Recapitulation of Fixed-Capital Accounts", comprises the fixed-capital-accounts ledger as kept by this particular electric utility. It is very simple in form, and, of course, is entirely dependent upon the subsidiary records for any detail.

Determining the Original Cost of Retired Property. - When new property is acquired or new plant is constructed the original cost thereof should be segregated as to principal units and properly entered in records provided therefor, so that it will be available when these units are retired. The methods and forms used for preserving the original cost varies with the different classes of property and other conditions. The methods used by a certain large electric utility, in providing such records of the original cost of generating plants and transmission and distribution system, may be stated as follows:

Generating Plants. - The engineering department keeps a record of all additions to the fixed-capital accounts covering generating plants classified according to account numbers and also according to location. This record contains the following columns:

Work-order number.
Location (More specific designation than is indicated by the entire sheet.)
Description.
Estimated cost.
Date work order was issued.
Date work order was closed.
Actual cost.
Remarks.

When an item of property is to be retired, the work order under which it was installed is located thru this record. The detail of this work order is then gotten out of the files and used in determining the actual original cost of the property to be retired. In many cases it will still be necessary to make certain estimates, especially of such items as labor of installing the equipment, as the labor charge shown under the work order might cover the labor of installing several different units that were installed at the same time. In order to make the total cost of individual units more readily available at the time it will be wanted in connection with the retirement of those units, the engineering department classifies all of the actual costs of a certain work order according to the various types of apparatus installed on that work order. The form shown in Form 20 is used for that purpose and shows a comparison of the actual cost with the estimated cost. Up to the present time the company has not devised a scheme for recording the labor costs for the various units or types of apparatus installed on the same work order.

Transmission and Distribution. - This company operates in but one city and does not keep records of the original cost of the individual units of its transmission and distribution lines segregated as to distribution or areas. With a great net work of lines in which changes are constantly taking place, it would involve an immense amount of bookkeeping to maintain a record of the original cost of each unit or portion of line in service. The company does, however, have records of the unit costs of the various types and sizes of conduit, cable, poles, etc. These unit costs are applied to any units or sections of line removed.

Removal of Retired Property from Fixed-Capital Account.- In most cases this company prepares a separate order to cover the removal or retirement of fixed capital, even tho it is to be replaced by another unit. The cost of removing the property is charged against this work order, and the actual credits received for the material recovered are credited thereto. The difference between these two entries is credited (or in case of the cost of removal exceeding the salvage,) charged to the fixed-capital accounts. This entry closes out the work order. At the same time a record is made on a ledger sheet entitled "Property-Retired Ledger Sheet", (Form 21). A specimen entry has been shown on this form. After entering the work-order number and the account number affected, and the description of the work, there is entered in the first column, entitled "Estimated Original Cost", the amount shown on the original work order as the estimated original cost of the property retired. In case the salvage exceeded the cost of removal the net credit is shown in red in the next column. However, in case the opposite was true, the net would be shown in black in the third column. The last column shows the total amount to be removed from the fixed-capital account, and consists of the difference between the first and the second columns or the total of the first and third columns. To a certain extent, as found convenient, separate pages are maintained for each account or for each type of apparatus or location. A summary is made of the amounts shown in this property-retired ledger, classifying the amounts according to account numbers. This forms the basis for the journal entry which removes from the fixed-capital accounts such portions of property retired as have not already been removed thru the credits for salvage received, as has been explained.

Form 22 shows a form of card used for keeping the details of the investment in each of the fixed-capital accounts. Each of these cards represents one work order, and the total of all of the cards should equal the total of the fixed capital.

Stores-Department Records. - Most of the forms and methods used by the stores department of a utility are approximately the same as those used by industrial and mercantile establishments. For this reason no complete explanation of the stores-accounting methods will be attempted at this time; nevertheless, a few forms will be illustrated and briefly discussed. The forms illustrated are all in use by one of the large electric utilities operating in the state of Illinois.

A purchase order of the usual form is required for every purchase except very minor purchases charged thru the petty-cash account. When the purchased goods are received, the receiving ticket is filled out and forwarded to the stores department. The vendor sends the invoice to the purchasing department, and that department sends the original of the invoice to the stores department, where it is filed until the receiving ticket is received from the department receiving the goods. After the storekeeper is advised that the goods covered by a certain invoice have been received, he lists that invoice on the schedule of stores invoices shown in Form 23, showing the purchase order number, the shipper's name, the date of invoice, and the amount. All of such invoices for the same day are listed upon this same schedule, and at the close of the day the invoices, together with the schedule, are sent to the auditing department. The auditing department prepares the voucher and summarizes these to make the monthly journal entry, charging material and supplies and crediting vouchers payable.

Materials are withdrawn from stock on a supply ticket, such as shown in Form 24. After the storekeeper has issued the material called for by this supply ticket, he sends the original to the general-stores department, where the material is priced and extended and a certain amount added for overhead. A separate supply ticket is used for each account to be charged with the materials required. These are assembled into certain batches as convenient and are sorted by account numbers. If there are several tickets for one account, a recapitulation is made, such as is shown in Form 25. The several tickets for the one account are then fastened to this recapitulation sheet and thereafter are considered as one ticket. The stores department then gives the tickets a serial number, by which it is thereafter recognized. The supply tickets are then listed on certain schedules, such as shown in Form 26, showing the ticket number, the account number, the total cost, and the amount added for stores-department overhead. The supply tickets, together with this schedule, are then sent to the auditing department, where the tickets are charged individually to the respective accounts and material and supply account is credited with the total of these schedules for the month. Credits for returned materials are handled in the same way.

This company does not use the centralized system of stock records. Each storeroom keeps a perpetual-inventory record by quantities only. Pricing of all material withdrawn from stock is done by the general storekeeper. For its stock record the company uses a loose-leaf binder, together with stock sheets, such as shown in Form 27.

The original copy of the sales ticket for merchandise sold in the company's salesroom is sent to the office of the general storekeeper to have the cost figures inserted thereon and proper entries made. The storekeeper summarizes these sales tickets on a schedule of "bills rendered merchandise". Where the sales are made on account, he also prepares the bill. This schedule is then sent to the auditing department for entry in its records and forms the basis for the credit to sales and charges to accounts receivable for the sale price of the goods sold and also the charge to sales and the credit to materials and supplies for the cost of the goods sold.

Reader's Test of Subject Matter in Chapter IX

The following questions are given to enable the reader to check himself as to his grasp of the important points discussed under the subject "Accounting Methods and Procedure."

1. Discuss the form of organization in a public utility.
2. What are the principal books of account?
3. Explain the use of the voucher and compare its use with the journal voucher.
4. What is the function of the journal?
5. Describe each of the three forms and their uses for accounting for the sales of gas, water, or electrical energy.
6. Explain fully the system of billing and keeping the consumers' ledger with the use of the Elliott-Fisher machine, and state the advantages of the system over the method of billing by hand.
7. What is the function of the operating ledger, and show from what sources the entries to this record come.
8. Explain the method of distributing pay-roll charges and the balancing of the pay rolls.
9. What is the purpose of the investment ledger?
10. How is the original cost of a unit of inside plant determined when it is to be retired?
11. Explain the procedure to take out the original cost of retired property from the fixed-capital account.
12. Explain the use of the stores records and indicate their importance in controlling the quantities of materials in stores.

Chapter XI

INCREASING IMPORTANCE OF PUBLIC-UTILITY ACCOUNTING

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The essential points brought out in this section are briefly summarized in the following:

1. Recent years have witnessed many important changes in the legal and economic status of public utilities.
2. Changes that have taken place in accounting have come about partly as a result of laws and commission rules requiring systematic accounting and partly from a clearer recognition by utility officers of the necessity for exact and lucid financial and operating statements.
3. Under state regulation, the law of supply and demand operates only partially.
4. Great progress has been made toward the adoption and general recognition of standards of procedure in matters relating to rate making.
5. So long as there is the absence of agreement as to what depreciation is, there will inevitably be divers theories as to how it can best be counteracted.
6. The fact that the commission prescribes accounting methods and examines the utility books adds to the public confidence in the integrity of financial statements.

CHANGES IN LEGAL AND ECONOMIC STATUS OF PUBLIC UTILITIES

Recent years have witnessed many important changes in the legal and economic status of public utilities. In the earlier years of their development it was recognized that since the business was essentially monopolistic in character, and therefore free from the restraints imposed by competition, the public interest required some regulative measures as a protection against the charging of excessive rates, discrimination as between patrons, and other practices which might be disadvantageous to the public.

Experiments were made with various forms of regulation, of which the principal ones were:

1. Encouragement of competition by the granting of municipal-franchise rights or licenses for operation in the same field by a second utility company.
2. Regulation by means of municipal ordinances specifying the rates to be charged.
3. State legislation directly fixing by statute maximum rates for public-utility and railway service.

In numerous cases municipalities acquired utility property and engaged in the public-utility business. With a few exceptions, however, municipal-operation projects did not prove successful or popular.

All of the methods of regulation with which experiments were made developed inherent faults and were generally abandoned, being superseded by the present form of regulation by a state commission having jurisdiction over all utilities within the state. Commission regulation, as now generally applied, may be said to have had its beginning about the year 1905. It gained favor rapidly, and has been adopted by various states, until at the present time all states except one have a state regulatory commission, altho the extent of authority delegated to the commissions varies considerably in the different states.

Changes in Accounting Methods. - As a means of making regulation effective, most of the commissions were given authority to prescribe the accounting methods to be used by utility companies. Accordingly, each commission prescribed a system of accounts conforming to its particular ideas, without much regard to what was prescribed by the other commissions. The inauguration of these classifications of accounts marked an important advance, and there has followed a very distinct and general improvement in public-utility accounting. Sound accounting principles have been introduced in places where previously lacking, and these principles have been everywhere better defined, understood, and applied. Methods of classification and procedure have been systematized and improved.

The changes that have taken place in accounting have come about partly as a result of laws and commission rules requiring systematic accounting and partly from a clearer recognition by utility officers of the necessity for exact and lucid financial and operating statements. In fact, there has prevailed a spirit of cooperation between commission authorities and utility accountants that, nothwithstanding some differences of opinion and viewpoint, has made possible some very important achievements in the line of better accounting.

One of these achievements, notable, particularly, from the standpoint of uniformity of principles and methods, was accomplished when a majority of the states adopted the uniform classification of accounts as formulated and recommended by the National Association of Railway and Utilities Commissioners. Uniformity in the statement of like facts has been accomplished, with the result that operating and financial statements of a company may be compared, not only with its statements for other periods, but with those of all other companies engaged in similar business in the same state or in various other states.

For the results accomplished by this work credit is due both to the National Association of Commissioners, its Committee on Statistics and Accounts, and to the accounting committees of the associations representing the electric-utility industry and the gas-utility industry, who gave earnest and efficient co-operation in the undertaking and did much to stimulate the interest of public utilities in extending the use of the uniform classifications.

Law of Supply and Demand Not Completely Operative. - Under state regulation, the law of supply and demand operates only partially. A utility is subject to the same competive conditions as other industries with respect to what it buys. It likewise must secure its capital in competition with other business enterprises. But when it sells its own product, which is service rather than a commodity, it charges therefor what the state says it may charge.

State authorities, however, are required to allow rates that are considered fair and reasonable, both to the utility investor and to the public, but there are no statutory or constitutional rules defining the methods or standards by which property values are to be determined or the rate of return specified. What, then is the procedure for deciding these important issues as between the owner of the property and the user of the service?

Recognition of Standards of Procedure in Rate Making. - Under the administration of regulatory commission, great progress has been made toward the adoption and general recognition of standards of procedure in matters relating to rate making. It has now become well established by commission and court decisions that a "reasonable" rate of return must be allowed on the "fair value" of the property at the time it is being used in the public service. The determination of the rate of return is largely a matter of judgment, enlightened by a knowledge of the prevailing rates for money in business enterprises in which the hazards may reasonably be compared with those of the utility industry. A practical consideration that cannot well be ignored is that if a public utility is to continue to obtain capital to keep its plant capable of meeting public requirements it must be assured of earnings sufficient to attract the necessary capital on reasonable terms.

The determination of "fair value", as we have observed, is dependent principally upon an ascertainment of the original cost of the property, the amount that would be required to reproduce it, the existing depreciation, the measure of going value, and the capital used for working funds, including materials on hand. In making appraisals, it is the usual practice to make a detailed inventory of the property. An estimate of the original cost is obtained by applying to the items inventoried prices as of the date of construction as nearly as they can be obtained.

An estimate of the cost to reproduce the property is obtained by applying to the inventory the prices prevailing as of the date of valuation.

The necessity for making an estimate of original cost in this laborious and expensive way arises principally from the fact that the earlier accounting records were imperfectly kept. Had the records been kept in accordance with the present practice as prescribed in the uniform classification of accounts, there would have been saved many millions of dollars that have been expended in appraisal work, and large sums involved in pending rate adjustments held in abeyance months and years awaiting the final determination of "fair value."

With accounts accurately showing original cost and the approximate date of installation of property, it should not be an expensive or protracted procedure, by the use of reliable price-index figures, to determine the approximate amount that construction of the property would have cost at current price levels at any time when a valuation is desired; thus, in the various steps taken with reference to valuation work, great economies should result when full and accurate statements of cost can be made from the accounting records.

Status Regarding Depreciation. - From whatwever viewpoint examined, the subject of depreciation of public-utility property is important, and it becomes doubly so when confused methods of dealing with it are introduced. If the capitalization is to remain sound, so that both the public served and the public serving thru the loan of its capital may obtain justice, the investment of new money must not be required for the purpose of replacing parts of the original construction when their servicability is at an end. Property equal in value to the parts replaced must be paid for out of income. This may be done by charging directly as a part of the operating expense the cost of replacements. It is usually preferable, and sometimes necessary, to reserve sufficient income annually to provide for making the more important replacements.

Review of the more important theories and practices with reference to depreciation discloses that there has been and still is a very considerable amount of disagreement as to the purpose of making charges to income representing so-called depreciation or retirement expense. This lack of accord is due in a large measure to disagreement on the more fundamental question as to what really constitutes depreciation or loss in value of property. For it is only with a proper understanding of the nature and extent of such loss that a means of guarding against it may be intelligently chosen. So long as there is the absence of agreement as to what depreciation is, there will inevitably be divers theories as to how it can best be counteracted.

The principal methods employed to offset or counteract depreciation are characterized as "straight-line method," "sinking-fund method," "retirement-loss-equalization method," and "replacement method." The last named being the one which employs no reserves. In the application of these various methods there are necessarily important differences in the results, from the standpoint of capital values as well as with reference to the charges to income. This is true because they are based on different conceptions of loss in property values. The depreciation that is to be provided for by charges to income is determined by the conception of the loss that is taking place, or will take place if not provided against, in property values. It is only that loss that can be charged to income.

We have observed that reserves based on the straight-line theory will accumulate amounts greatly in excess of those which can be used for replacements so long as the business is continued. The reason for this is that in any property that has been operated for some time a considerable part of the life of component parts has expired, but it would be folly to destroy the whole plant merely to rebuild it so as to have it new in all its parts. And unless this is done, such reserves can never be used, so far as they represent the aggregate of elapsed life of property still in good serviceable condition rather than amounts that can be made use of for replacements.

It has also been observed that even tho a public utility should prove not to be a practically perpetual institution, and should be destroyed or its life otherwise terminated, the straight-line theory would afford comparatively little protection to the investor, especially where the reserves have been reinvested in the property, as is the usual practice. In view of these conditions, it may well be asked whether the creation of such large reserves do not place a heavy burden upon the business, to the detriment of the utility, its patrons, or both.

While the question of adopting a sound theory as to the depreciation of property is important, it is of even more vital importance that, whatever the theory adopted, consistency be used in the application of the theory chosen. Inconsistency leads on the one hand to confiscation of property thru deductions from valuation that are not compensated by income, and on the other hand to charging the public excessive rates as a result of burdening income, under the guise of depreciation, with amounts not required to protect the investment.

In the present state of development of theories and practices relative to depreciation, the accountant and financial officer in dealing with the accounting phases of depreciation or retirement losses must labor under some limitations and restrictions. Where a court or commission order has dealt with the subject with reference to a particular property, or certain methods of the regulatory authorities have become well established, the accounting will be affected thereby, even tho the methods employed are not entirely sound.

The trend of opinion, both in the public-utility industry and among regulatory commissions, indicates a tendency not to make heavy deductions from property value merely on theoretical assumptions, and, consistent with this view, not to sanction the creation of excessive reserves. There is reason to hope that at no distant date the courts also will have obtained a clearer view of the various economic aspects of this subject. Much remains to be done in the way of clarifying the subject, and accountants who grasp both the fundamental elements involved and the accounting processes can do much to clear away the fog.

Informing the Public on Financial Matters. - The accurate rendering of consumers' accounts thus avoiding inconvenience and perhaps irritation, is important to any public utility. There is also an important advantage gained in public proceedings regarding adjustments of rates when the accountant presenting evidence drawn from the books is able to present accurate and comprehensive statements and fully explain them in a candid, straightforward manner. Presented in this way, the valuable element of public confidence is usually assured. This matter is quite important, for the reason that there still exists in some quarters more or less of the old idea that the books may be more or less juggled to serve particular purposes.

Only recently we heard the charge made at a public hearing that a certain utility kept two sets of books, one for its own information and the other for the information of the public. The public is, however, becoming much better informed on such matters. The fact that the commission prescribes accounting methods and examines the utility books has not only done much in a corrective way, in cases where correction was needed, but has added to the public confidence in the integrity of the financial statements.

Our observations as to the various ways in which the accounts of public utilities have a bearing on the problems of operation and management indicate that the modern accounting needs of the public utility reach far beyond the old conception of accounting as representing simply the recording of income and outgo, with proper safeguards against loss.

While the accounting must always aim at the accomplishment of these objects, it has come to play a more important part in the direction of operating and managerial policies, for without accurate costs and informative statistics the operator is greatly handicapped. Nor can the public-utility accountant be satisfied with routine functioning of the bookkeeping processes and a perfunctory rendering of operating and financial reports at stated intervals. He must be awake, not only to the opportunities for effecting improvements and economies in his own department, but must also keep sufficiently in contact with what is going on thruout the utility organization to enable him to discern opportunities for supplying in convenient and understandable form such data as will enable the management constantly to test the efficiency of operating processes and units, and thus strengthen any developing weak spots in the organization.

Efficiency is relative, and therefore tested by comparison. Efficiency engineers must have cost studies on a comparable basis. Comparisons depend upon uniformity and accuracy in recording and assembling facts.

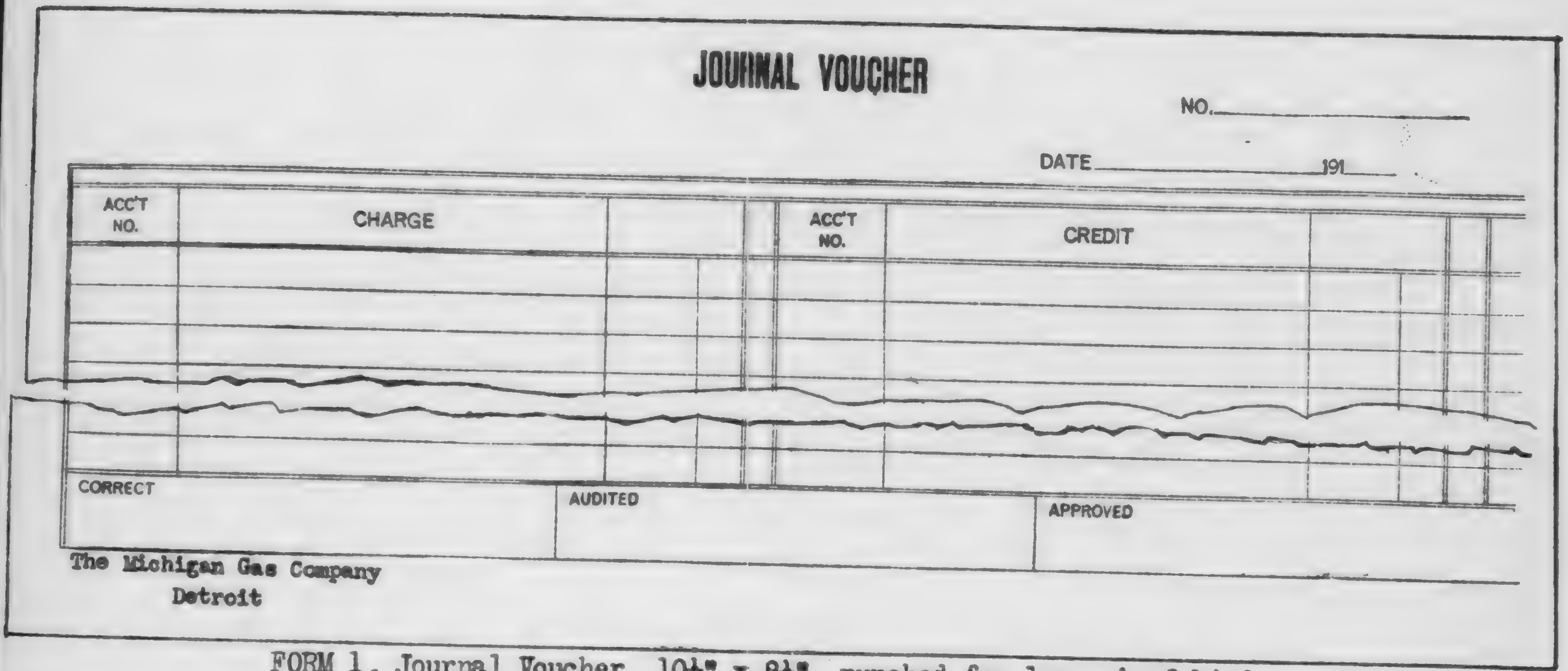
Under present forms of regulation, the revenues of public utilities and the rates from which they are derived are no longer a subject of barter and compromise between a utility and municipal authorities, nor are they determined by competitior or to any large extent by "what the traffic will bear." The elements determining rates under a system of state regulation are principally the costs incident to the various classes of service, including the cost of operation, the cost of capital borrowed, and a return on capital owned, properly allocated to various functions and classes of the service. The controlling facts as to costs are to be found in the accounts.

One cannot study the problems of public utilities and the changes that have taken place in recent years without being impressed with the enlarged responsibilities and opportunities that have come to the accounting representatives of public utilities. It is earnestly hoped that the reader of this treatise has found in this study some assistance in gaining a more comprehensive understanding of some phases of his work, particularly with reference to matters in which he comes in contact with problems involving the relations of management, regulatory commission or court, and the public in some of the varied and complex relations that attend the functioning of the public utility.

While this study has given attention to accounting forms and procedure, greater stress has been laid upon principles and matters of fundamental importance with which the accountant must deal and in which his success will be measured by his knowledge and appreciation of the problems of finance, management, and of public relations, which give the industry its unique position in our modern life and institutions.

APPENDIX A

ACCOUNTING FORMS AND RECORDS



JOURNAL VOUCHER

NO.__________

DATE__________191__

ACC'T NO.	CHARGE		ACC'T NO.	CREDIT	

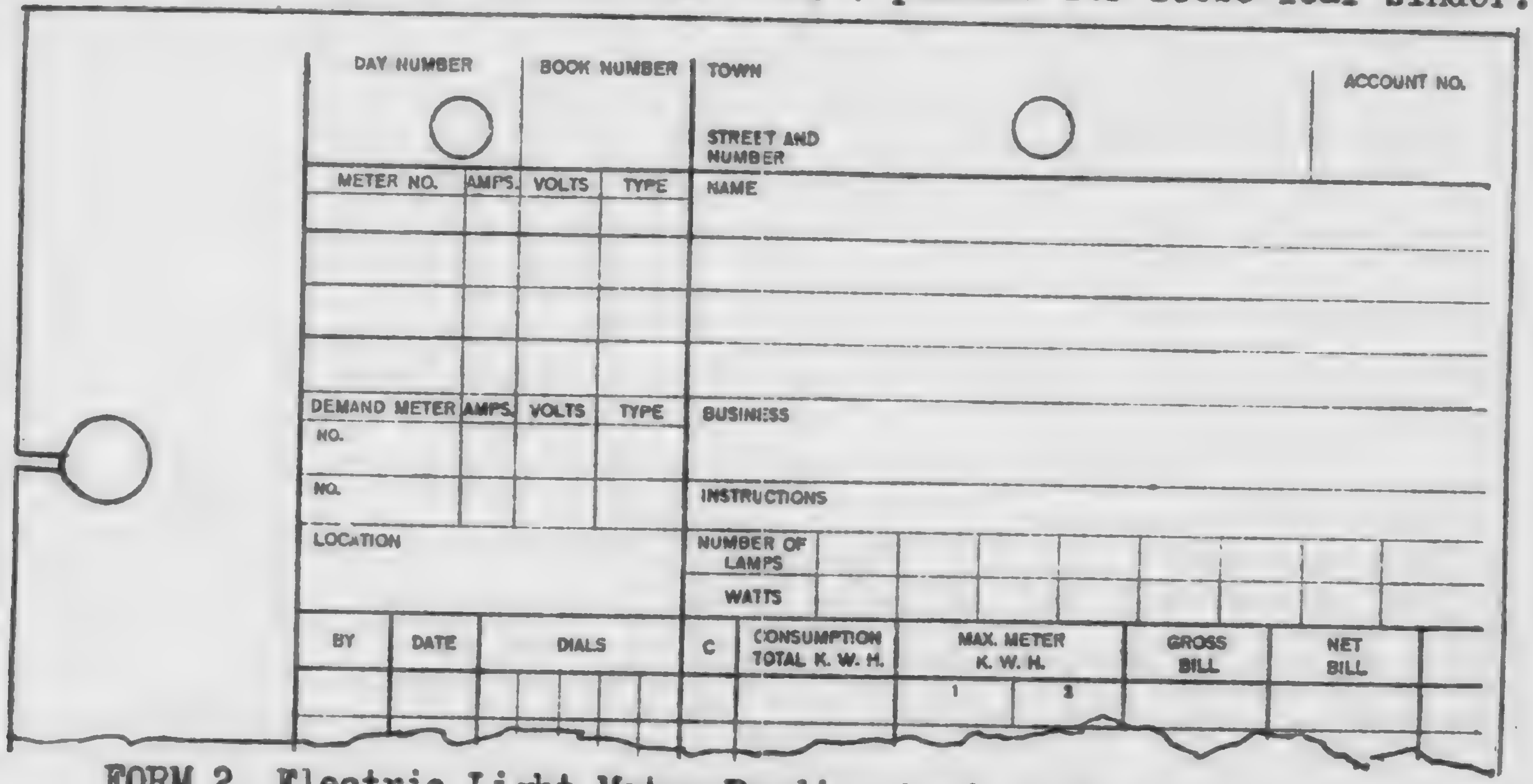
CORRECT

AUDITED

APPROVED

The Michigan Gas Company
Detroit

FORM 1. Journal Voucher, 10½" x 8½", punched for loose-leaf binder.



DAY NUMBER

BOOK NUMBER

TOWN

STREET AND NUMBER

ACCOUNT NO.

METER NO.	AMPS.	VOLTS	TYPE

NAME

DEMAND METER	AMPS.	VOLTS	TYPE
NO.			
NO.			

BUSINESS

INSTRUCTIONS

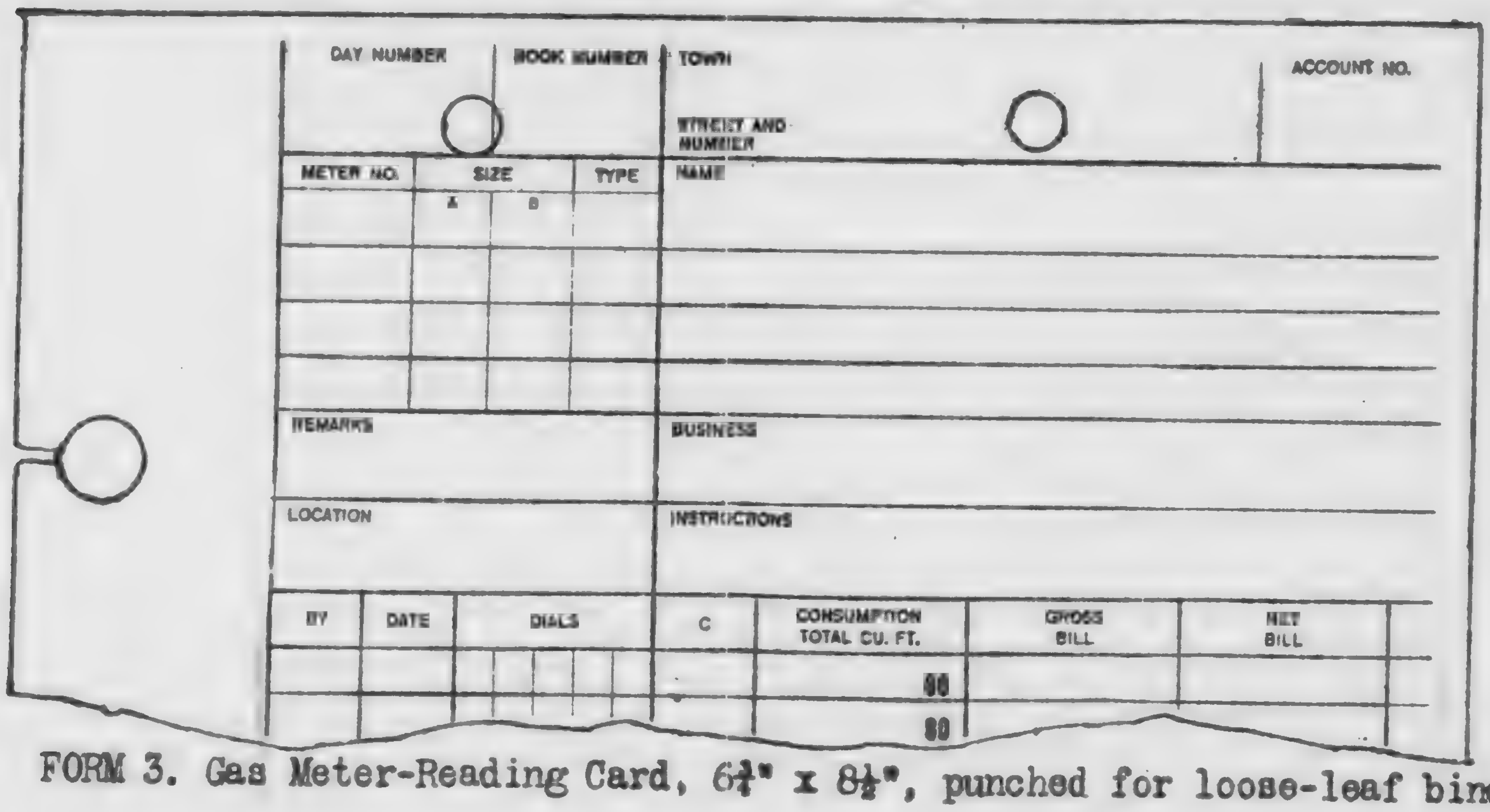
LOCATION

NUMBER OF LAMPS

WATTS

BY	DATE	DIALS	C	CONSUMPTION TOTAL K. W. H.	MAX. METER K. W. H.		GROSS BILL	NET BILL
					1	2		

FORM 2. Electric Light Meter-Reading Card, 6¾" x 8½", punched for loose-leaf binder.



DAY NUMBER

BOOK NUMBER

TOWN

STREET AND NUMBER

ACCOUNT NO.

METER NO.	SIZE		TYPE
	A	B	

NAME

REMARKS

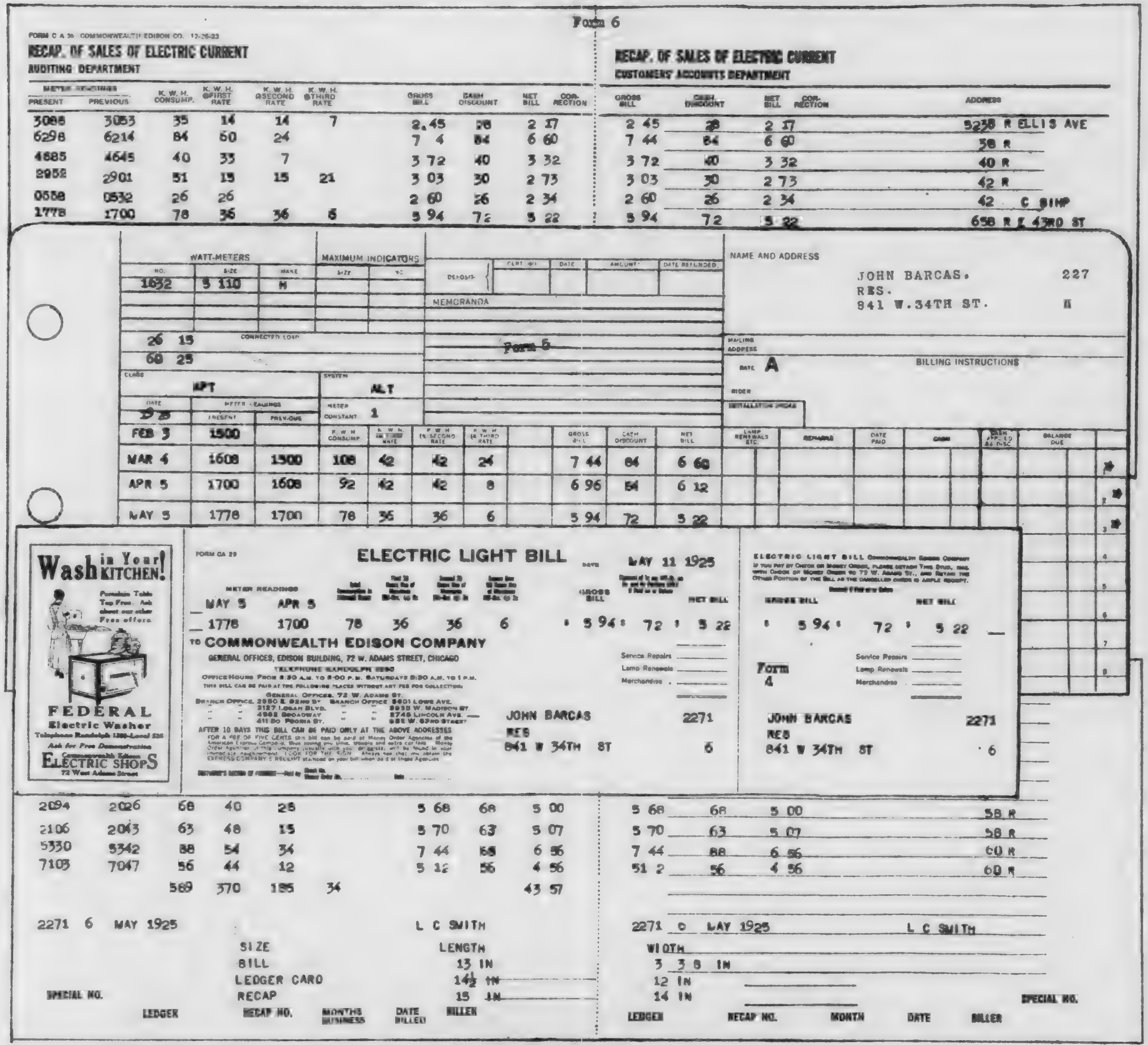
BUSINESS

LOCATION

INSTRUCTIONS

BY	DATE	DIALS	C	CONSUMPTION TOTAL CU. FT.	GROSS BILL	NET BILL
				00		
				00		

FORM 3. Gas Meter-Reading Card, 6¾" x 8½", punched for loose-leaf binder.



Form 6

FORM C A 36 COMMONWEALTH EDISON CO. 12-26-23

RECAP. OF SALES OF ELECTRIC CURRENT

AUDITING DEPARTMENT

METER READINGS PRESENT	METER READINGS PREVIOUS	K.W.H. CONSUMP.	K.W.H. @FIRST RATE	K.W.H. @SECOND RATE	K.W.H. @THIRD RATE	GROSS BILL	CASH DISCOUNT	NET BILL	CORRECTION
3086	3053	35	14	14	7	2.45	28	2 17	
6298	6214	84	60	24		7 4	84	6 60	
4685	4645	40	33	7		3 72	40	3 32	
2952	2901	51	15	15	21	3 03	30	2 73	
0558	0532	26	26			2 60	26	2 34	
1778	1700	78	36	36	6	5 94	72	5 22	
2094	2026	68	40	28		5 68	68	5 00	
2106	2043	63	48	15		5 70	63	5 07	
5330	5342	88	54	34		7 44	68	6 56	
7103	7047	56	44	12		5 12	56	4 56	
		569	370	185	34			43 57	

2271 6 MAY 1925 L C SMITH

SIZE LENGTH
BILL 13 IN
LEDGER CARD 14½ IN
RECAP 15 IN

SPECIAL NO.

LEDGER RECAP NO. MONTHS BUSINESS DATE BILLED BILLER

RECAP. OF SALES OF ELECTRIC CURRENT

CUSTOMERS' ACCOUNTS DEPARTMENT

GROSS BILL	CASH DISCOUNT	NET BILL	CORRECTION	ADDRESS
2 45	28	2 17		5238 R ELLIS AVE
7 44	84	6 60		38 R
3 72	40	3 32		40 R
3 03	30	2 73		42 R
2 60	26	2 34		42 C BIMP
5 94	72	5 22		658 R E 43RD ST
5 68	68	5 00		58 R
5 70	63	5 07		58 R
7 44	88	6 56		60 R
51 2	56	4 56		60 R

2271 6 MAY 1925 L C SMITH

WIDTH
3 3 8 IN
12 IN
14 IN

SPECIAL NO.

LEDGER RECAP NO. MONTH DATE BILLER

Form 5

WATT-METERS NO.	SIZE	MAKE	MAXIMUM INDICATORS SIZE	NO.
1632	5 110	H		

DEPOSIT CERT. NO. DATE AMOUNT DATE REFUNDED

MEMORANDA

CONNECTED LOAD
26 15
60 25

CLASS APT SYSTEM ALT

METER CONSTANT 1

NAME AND ADDRESS

JOHN BARCAS. 227
RES.
841 W.34TH ST. H

MAILING ADDRESS

RATE A BILLING INSTRUCTIONS

RIDER

INSTALLATION ORDER

DATE	METER READINGS PRESENT	METER READINGS PREVIOUS	K.W.H. CONSUMP.	K.W.H. @FIRST RATE	K.W.H. @SECOND RATE	K.W.H. @THIRD RATE		GROSS BILL	CASH DISCOUNT	NET BILL	LAMP RENEWALS ETC.	REMARKS	DATE PAID	CASH	CASH APPLIED AS DISC.	BALANCE DUE
3 25																
FEB 3	1500															
MAR 4	1608	1500	108	42	42	24		7 44	84	6 60						
APR 5	1700	1608	92	42	42	8		6 96	84	6 12						
MAY 5	1778	1700	78	36	36	6		5 94	72	5 22						

Wash in Your KITCHEN!

Porcelain Table Top Free. Ask about our other Free offers

FEDERAL

Electric Washer

Telephone Randolph 1280—Local 536

Ask for Free Demonstration

Commonwealth Edison

ELECTRIC SHOPS

72 West Adams Street

FORM CA 29

ELECTRIC LIGHT BILL

DATE MAY 11 1925

METER READINGS MAY 5	APR 5					GROSS BILL		NET BILL
1778	1700	78	36	36	6	$ 5 94	$ 72	$ 5 22

TO **COMMONWEALTH EDISON COMPANY**

GENERAL OFFICES, EDISON BUILDING, 72 W. ADAMS STREET, CHICAGO

TELEPHONE RANDOLPH 1280

OFFICE HOURS FROM 8:30 A.M. TO 5:00 P.M. SATURDAYS 8:30 A.M. TO 1 P.M.

THIS BILL CAN BE PAID AT THE FOLLOWING PLACES WITHOUT ANY FEE FOR COLLECTION:

GENERAL OFFICES, 72 W. ADAMS ST.
BRANCH OFFICE, 2950 E. 92ND ST. BRANCH OFFICE 3601 LOWE AVE.
" " 3127 LOGAN BLVD. " " 3935 W. MADISON ST.
" " 4562 BROADWAY " " 2746 LINCOLN AVE.
" " 411 SO. PEORIA ST. " " 851 W. 63RD STREET

AFTER 10 DAYS THIS BILL CAN BE PAID ONLY AT THE ABOVE ADDRESSES

FOR A FEE OF FIVE CENTS this bill can be paid at Money Order Agencies of the American Express Company, thus saving you time, trouble and extra car fare. Money Order Agencies of this company (usually with your druggists) will be found in your immediate neighborhood. LOOK FOR THE SIGN. Always see that you obtain the EXPRESS COMPANY'S RECEIPT stamped on your bill when paid at these Agencies.

Service Repairs
Lamp Renewals
Merchandise

JOHN BARCAS 2271
RES
841 W 34TH ST 6

ELECTRIC LIGHT BILL COMMONWEALTH EDISON COMPANY

IF YOU PAY BY CHECK OR MONEY ORDER, PLEASE DETACH THIS STUB, AND, WITH CHECK OR MONEY ORDER TO 72 W. ADAMS ST., AND RETAIN THE OTHER PORTION OF THE BILL AS THE CANCELLED CHECK IS AMPLE RECEIPT.

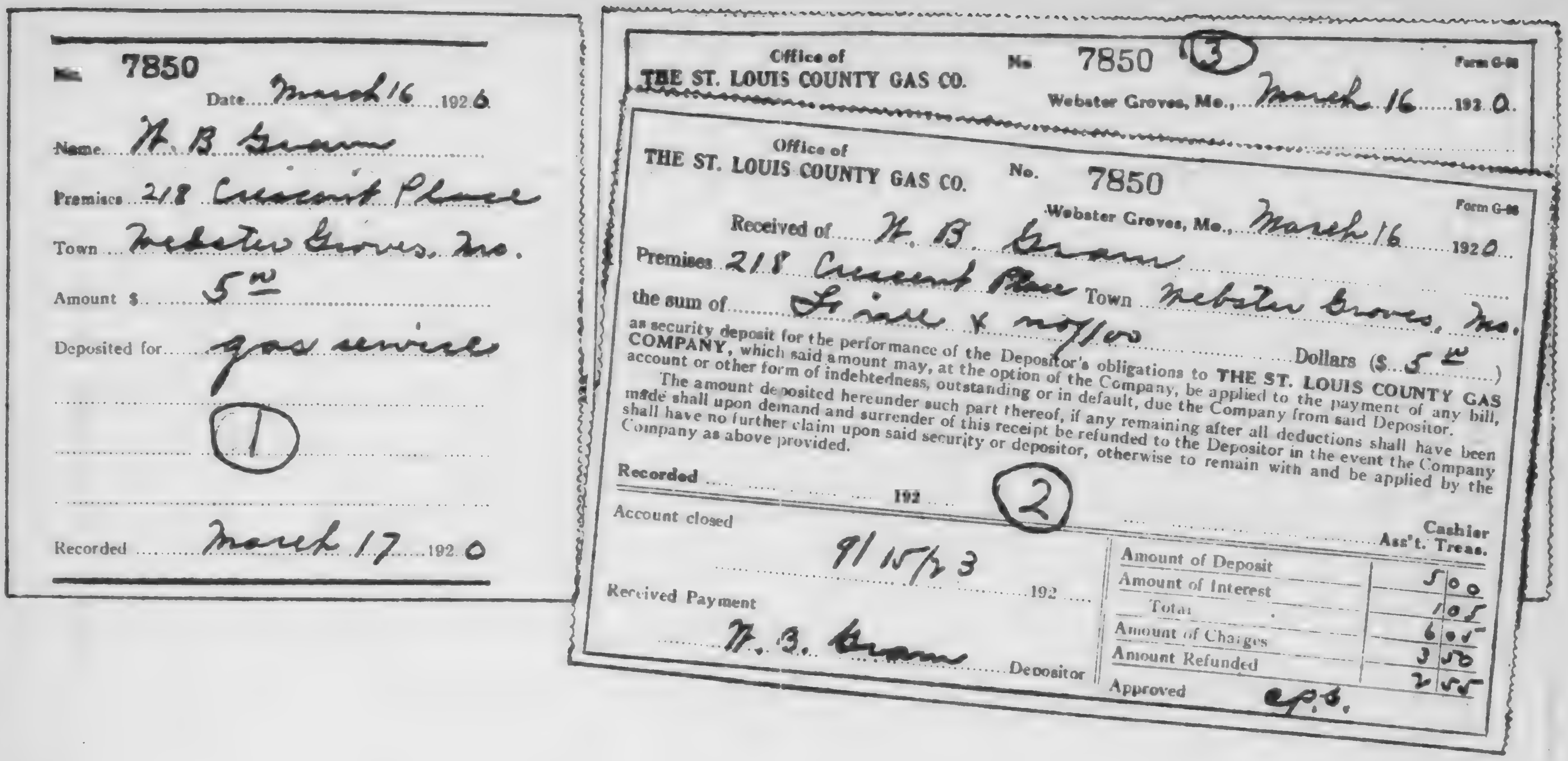
GROSS BILL		NET BILL
$ 5 94	$ 72	$ 5 22

Form 4

Service Repairs
Lamp Renewals
Merchandise

JOHN BARCAS 2271
RES
841 W 34TH ST 6

Form 4. Electric-Light Bill
Form 5. Consumer's Ledger Page
Form 6. Recapitulation of Sales (revenue sheet)



No. 7850
Date March 16 1926
Name W. B. Graun
Premises 218 Crescent Place
Town Webster Groves, Mo.
Amount $ 5 00
Deposited for gas service

①

Recorded March 17 1920

Office of
THE ST. LOUIS COUNTY GAS CO. No. 7850 ③ Form G-98
Webster Groves, Mo., March 16 1920.

Office of
THE ST. LOUIS COUNTY GAS CO. No. 7850
Form G-98
Webster Groves, Mo., March 16 1920
Received of W. B. Graun
Premises 218 Crescent Place Town Webster Groves, Mo.
the sum of Five & no/100 Dollars ($ 5 00)

as security deposit for the performance of the Depositor's obligations to **THE ST. LOUIS COUNTY GAS COMPANY**, which said amount may, at the option of the Company, be applied to the payment of any bill, account or other form of indebtedness, outstanding or in default, due the Company from said Depositor.

The amount deposited hereunder such part thereof, if any remaining after all deductions shall have been made shall upon demand and surrender of this receipt be refunded to the Depositor in the event the Company shall have no further claim upon said security or depositor, otherwise to remain with and be applied by the Company as above provided.

Recorded 192

②

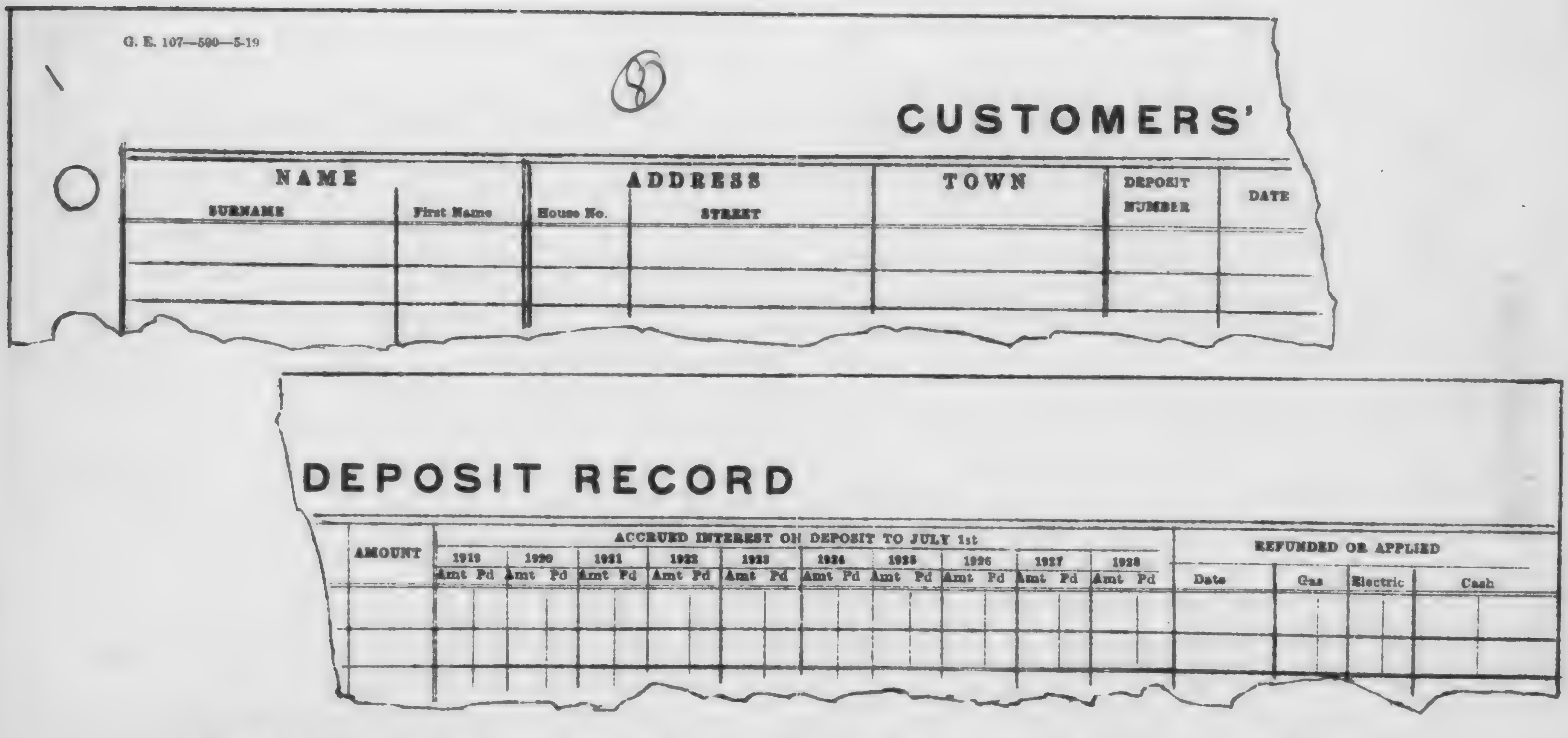
Cashier
Ass't. Treas.

Account closed
9/15/23 192

Received Payment
W. B. Graun Depositor

Amount of Deposit	5 00
Amount of Interest	
Total	1 05
Amount of Charges	6 05
Amount Refunded	3 50
	2 55
Approved	e.p.s.

FORM 7. Deposit Receipt Book. Receipt is made out in duplicate by slipping carbon paper between (2) and (3), which are afterwards detached at the perforated line to the right of (2). The stub, (1), is then filled out and (2) is given to the customer. The duplicate receipt, (3), is used for making entries in the Deposit Record (Form 8) and may be filed alphabetically by customer's name. The stub, (1), remains in the deposit receipt book and thereby provides a numerical file by receipt numbers.



G. E. 107—500—5-19

⑧

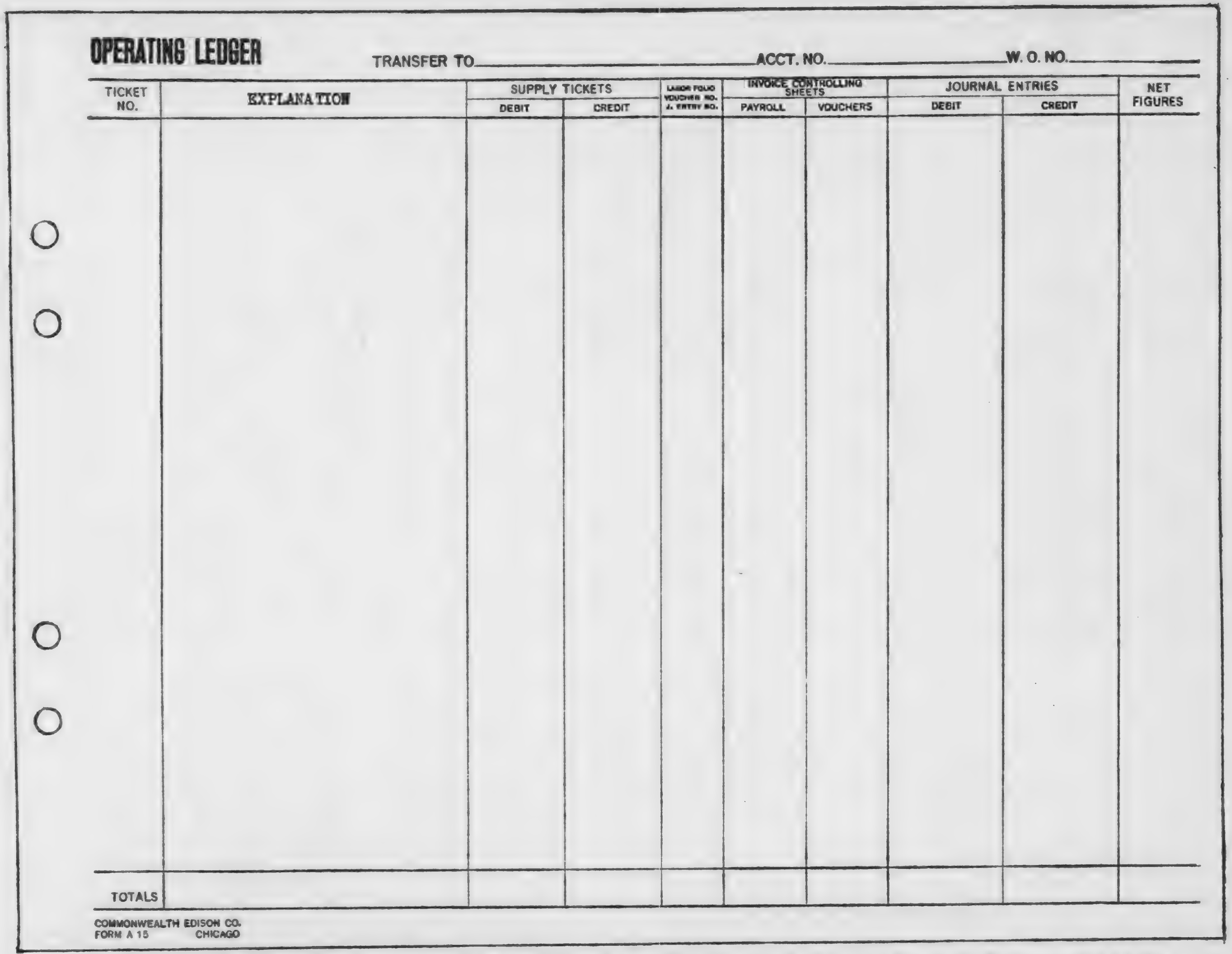
CUSTOMERS'

NAME		ADDRESS		TOWN	DEPOSIT NUMBER	DATE
SURNAME	First Name	House No.	STREET			

DEPOSIT RECORD

AMOUNT	ACCRUED INTEREST ON DEPOSIT TO JULY 1st																				REFUNDED OR APPLIED			
	1919		1920		1921		1922		1923		1924		1925		1926		1927		1928					
	Amt	Pd	Amt	Pd	Amt	Pd	Amt	Pd	Amt	Pd	Amt	Pd	Amt	Pd	Amt	Pd	Amt	Pd	Amt	Pd	Date	Gas	Electric	Cash

FORM 8. Customers' Deposit Record 17 1/4" x 11" , punched for loose-leaf binder.

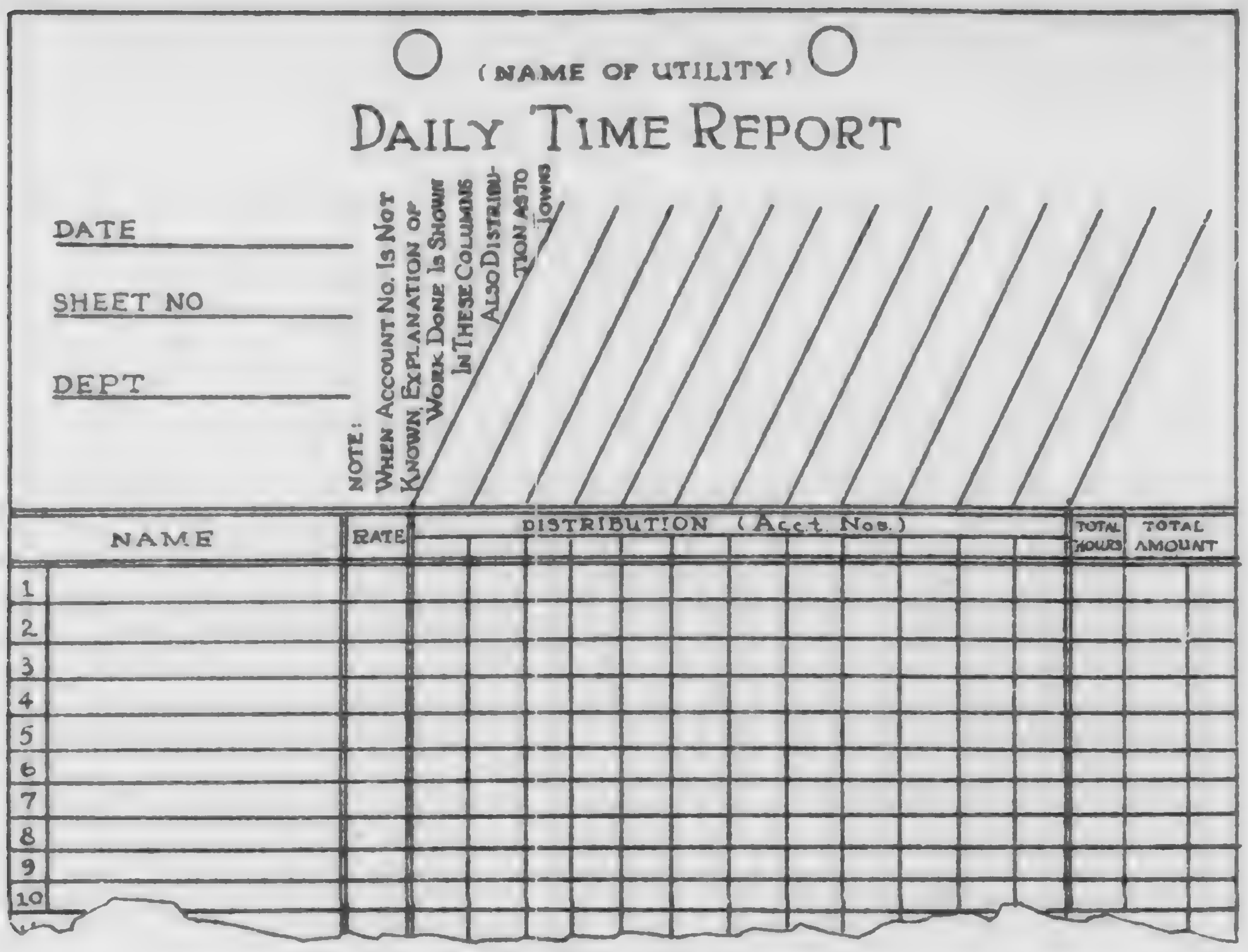


OPERATING LEDGER TRANSFER TO__________ ACCT. NO.__________ W. O. NO.__________

TICKET NO.	EXPLANATION	SUPPLY TICKETS		LABOR FOLIO VOUCHER NO. J. ENTRY NO.	INVOICE CONTROLLING SHEETS		JOURNAL ENTRIES		NET FIGURES
		DEBIT	CREDIT		PAYROLL	VOUCHERS	DEBIT	CREDIT	
TOTALS									

COMMONWEALTH EDISON CO.
FORM A 15 CHICAGO

FORM 9. Operating Ledger Account designed for use of a bookkeeping machine to record entries. The account is made in duplicate by slipping carbon paper between two sheets.



○ (NAME OF UTILITY) ○

DAILY TIME REPORT

DATE ______

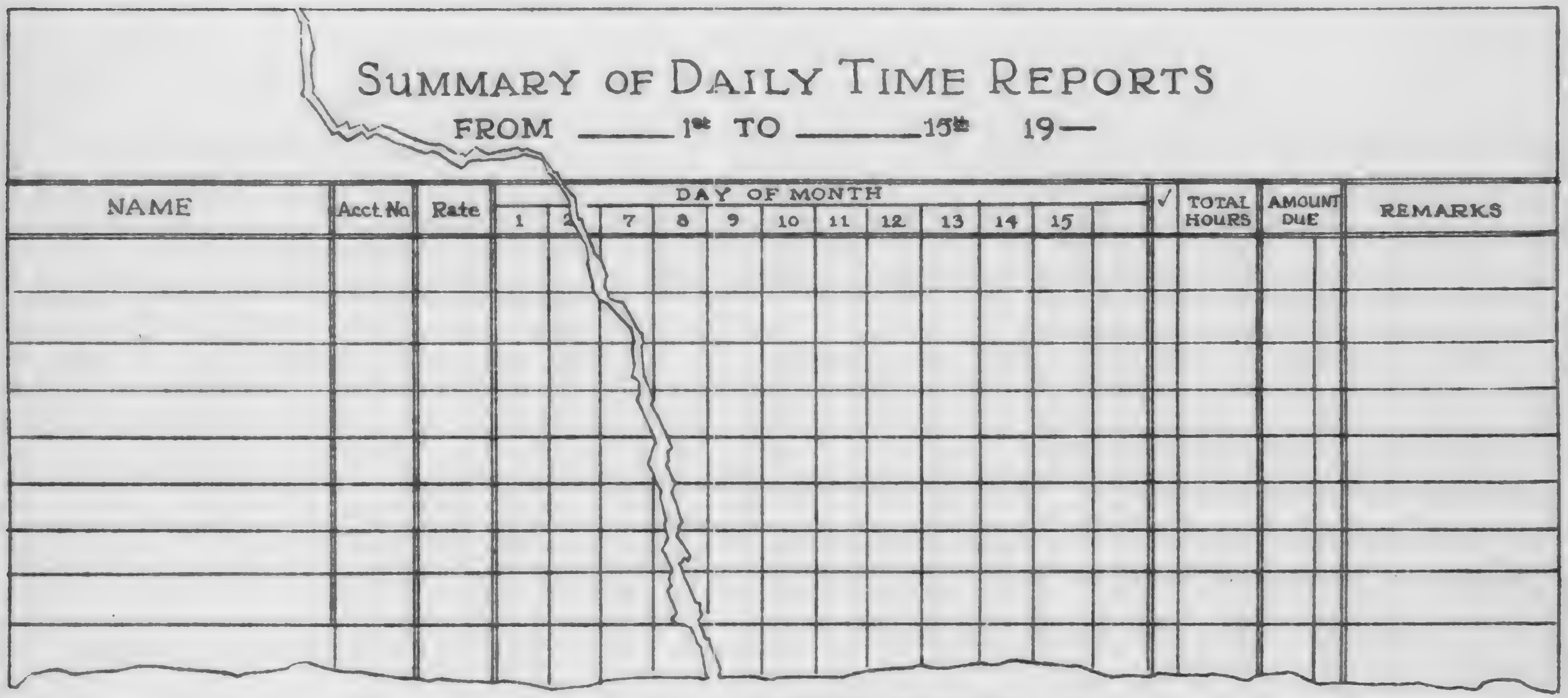
SHEET NO ______

DEPT ______

NOTE: WHEN ACCOUNT NO. IS NOT KNOWN, EXPLANATION OF WORK DONE IS SHOWN IN THESE COLUMNS ALSO DISTRIBUTION AS TO TOWNS

	NAME	RATE	DISTRIBUTION (Acct. Nos.)	TOTAL HOURS	TOTAL AMOUNT
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

Form 10. Daily Time Report (8½" x 10¾")

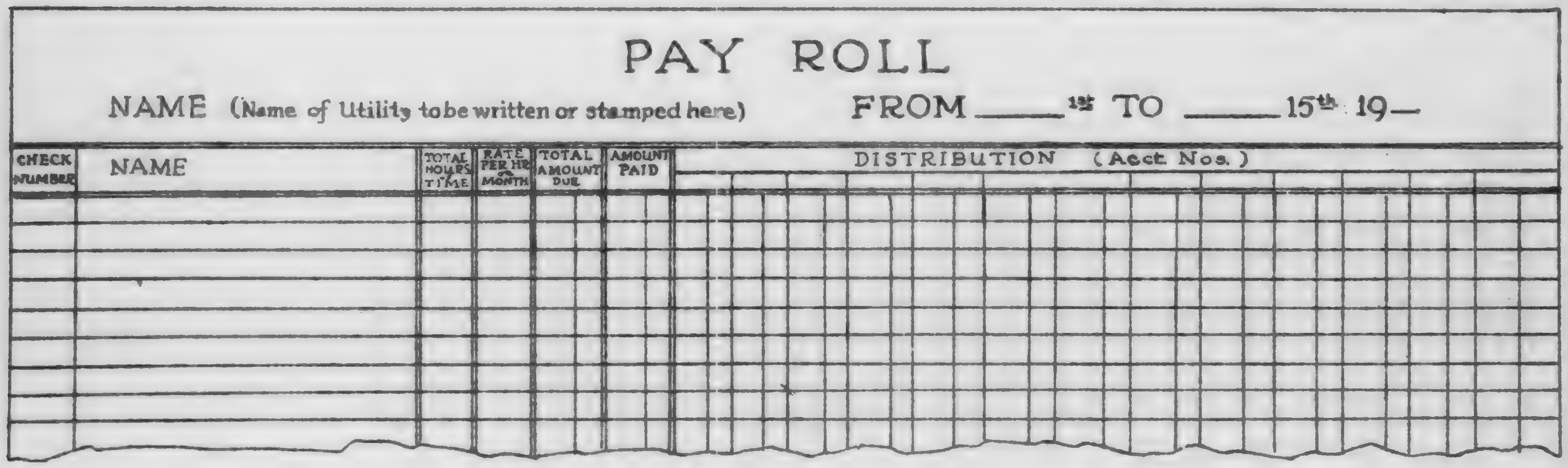


SUMMARY OF DAILY TIME REPORTS

FROM ______ 1st TO ______ 15th 19—

NAME	Acct. No.	Rate	DAY OF MONTH												✓	TOTAL HOURS	AMOUNT DUE	REMARKS
			1	2	7	8	9	10	11	12	13	14	15					

Form 11. Summary of Daily Time Reports (10" x 16")

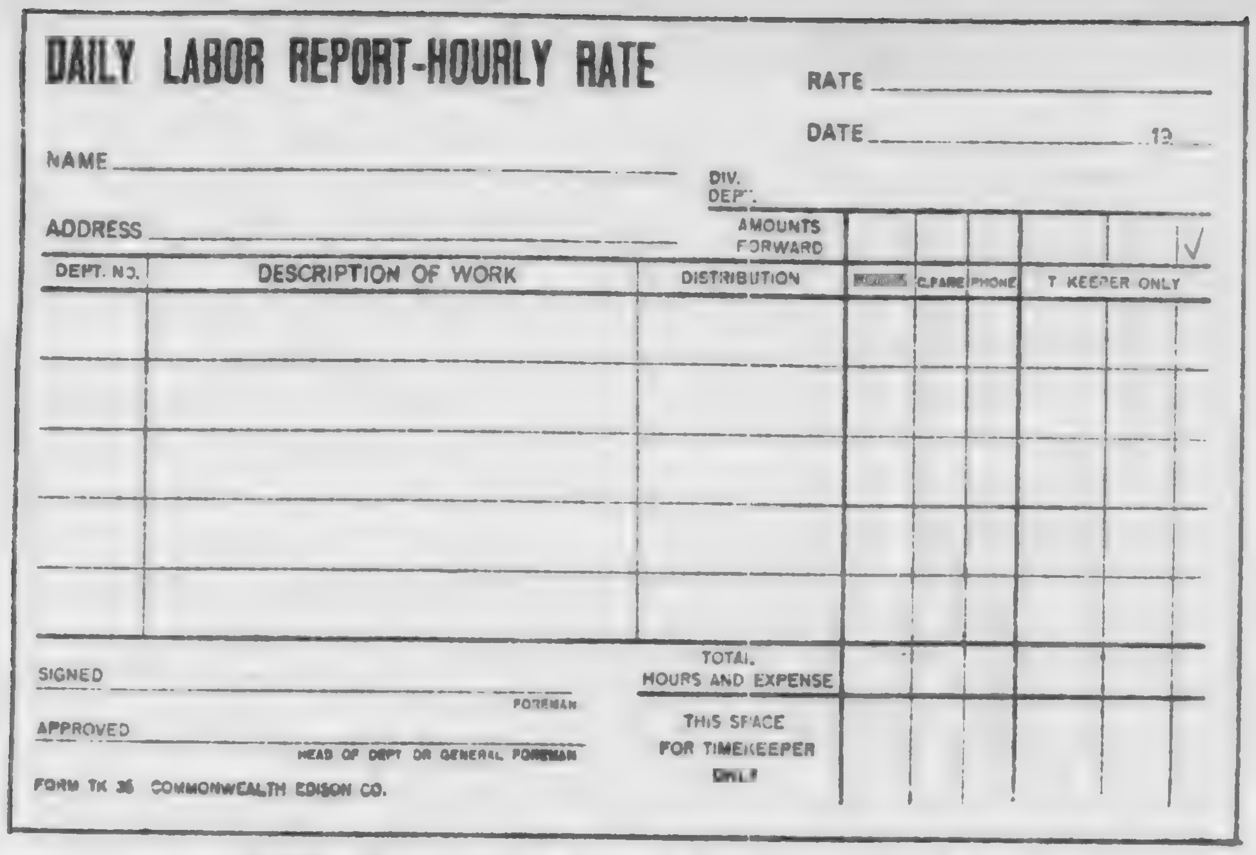


PAY ROLL

NAME (Name of Utility to be written or stamped here) FROM ______ 1st TO ______ 15th 19—

CHECK NUMBER	NAME	TOTAL HOURS TIME	RATE PER HR or MONTH	TOTAL AMOUNT DUE	AMOUNT PAID	DISTRIBUTION (Acct. Nos.)

Form 12. Pay roll, punched for looseleaf binder (15" x 10")



DAILY LABOR REPORT-HOURLY RATE

RATE ____________

DATE ____________ 19__

NAME ____________

DIV.
DEPT.

ADDRESS ____________

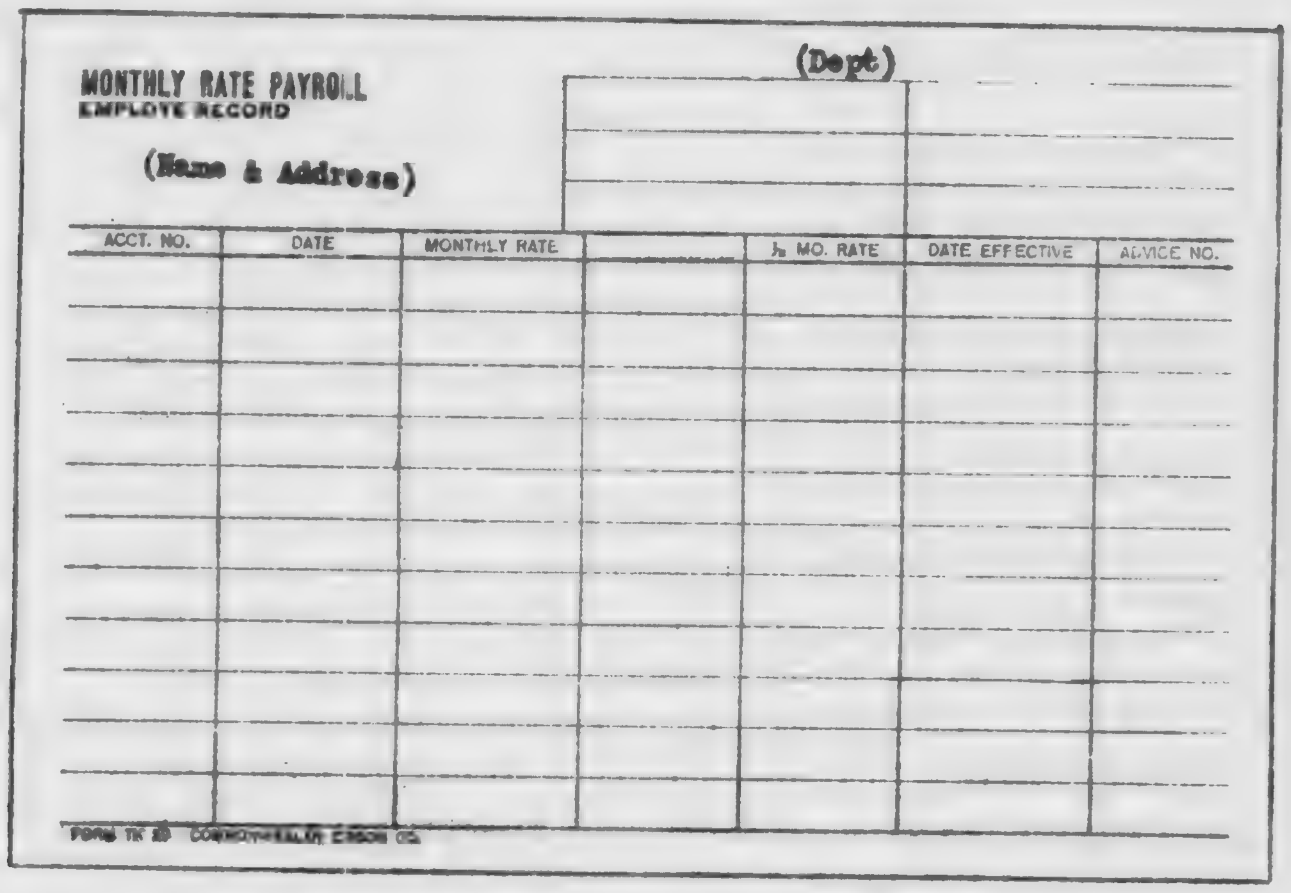
		AMOUNTS FORWARD					✓
DEPT. NO.	DESCRIPTION OF WORK	DISTRIBUTION	[illegible]	C.FARE	PHONE	T KEEPER ONLY	
		TOTAL HOURS AND EXPENSE					
		THIS SPACE FOR TIMEKEEPER ONLY					

SIGNED ____________ FOREMAN

APPROVED ____________ HEAD OF DEPT OR GENERAL FOREMAN

FORM TK 36 COMMONWEALTH EDISON CO.

FORM 13. Daily Labor Report, 6" x 4".



MONTHLY RATE PAYROLL
EMPLOYE RECORD

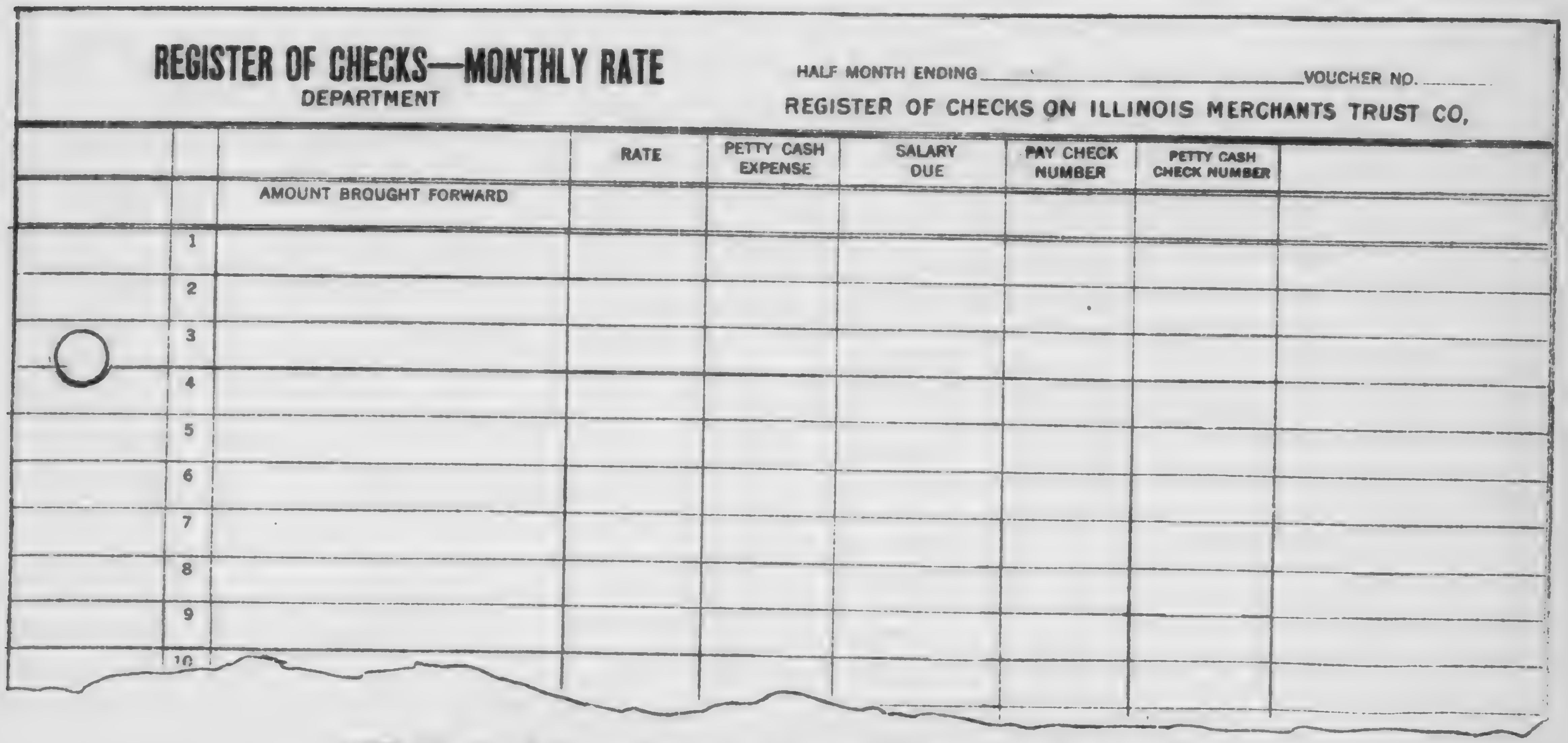
(Name & Address)

(Dept)

ACCT. NO.	DATE	MONTHLY RATE		½ MO. RATE	DATE EFFECTIVE	ADVICE NO.

FORM TK [illegible] COMMONWEALTH EDISON CO.

FORM 14. Employe Rate Record, 6" x 4".



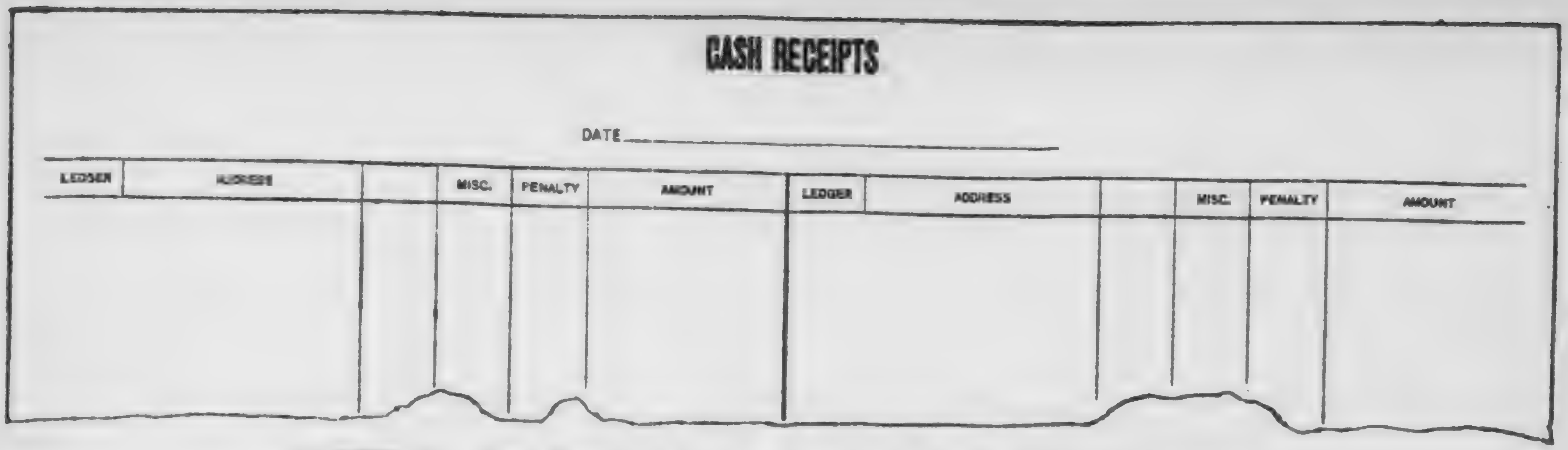
REGISTER OF CHECKS—MONTHLY RATE
DEPARTMENT

HALF MONTH ENDING ____________ VOUCHER NO. ______

REGISTER OF CHECKS ON ILLINOIS MERCHANTS TRUST CO.

			RATE	PETTY CASH EXPENSE	SALARY DUE	PAY CHECK NUMBER	PETTY CASH CHECK NUMBER	
		AMOUNT BROUGHT FORWARD						
	1							
	2							
	3							
	4							
	5							
	6							
	7							
	8							
	9							
	10							

FORM 15. Pay Roll or Register of Pay-Roll Checks, 11" x 16 3/4".

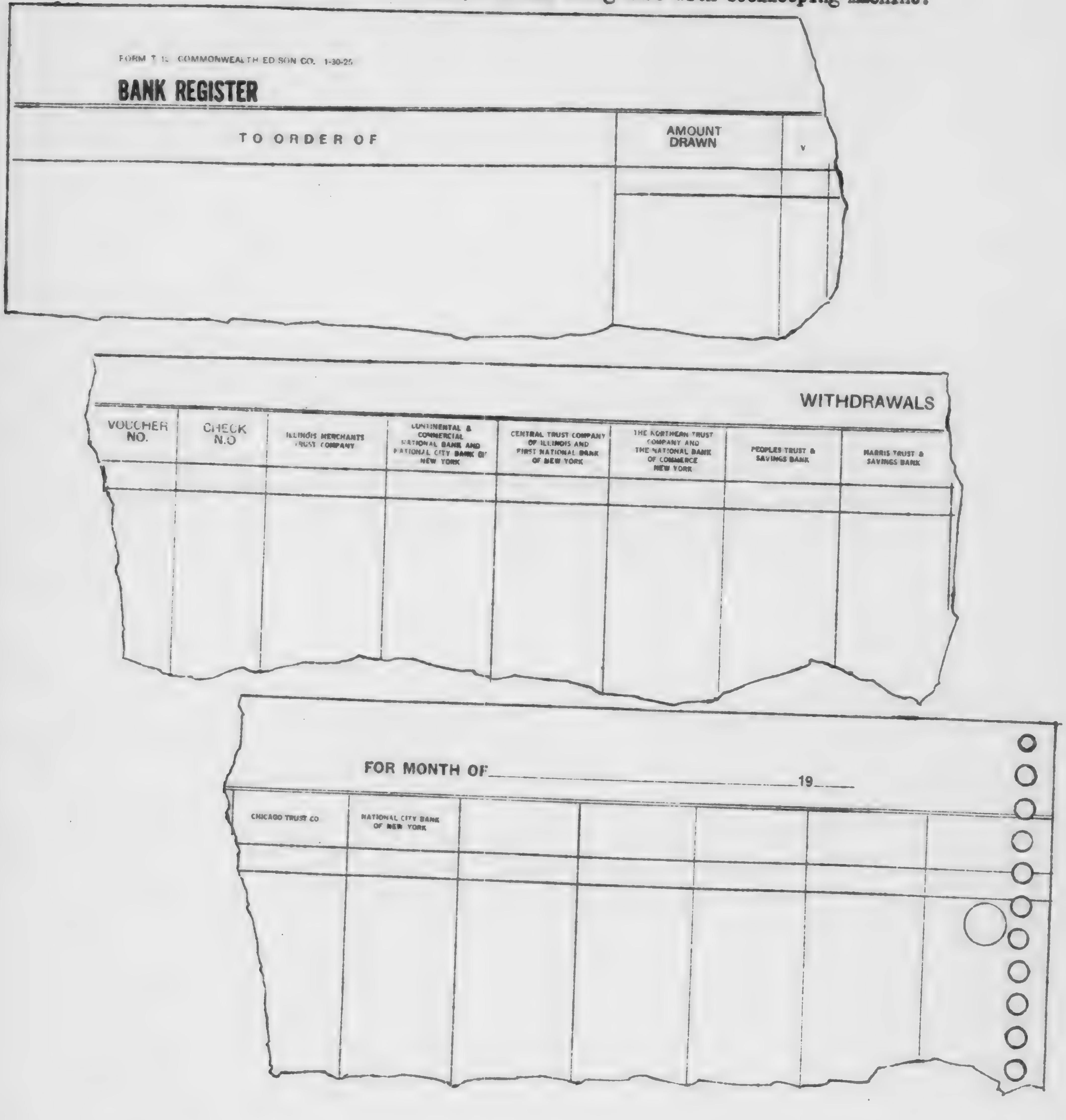


CASH RECEIPTS

DATE ____________________

LEDGER	ADDRESS		MISC.	PENALTY	AMOUNT	LEDGER	ADDRESS		MISC.	PENALTY	AMOUNT

FORM 16. Cash Receipts for Bookkeepers in the Customers' Accounts Division, 11" x 10½", entries being made with bookkeeping machine.



FORM T 12 COMMONWEALTH EDISON CO. 1-30-25

BANK REGISTER

TO ORDER OF	AMOUNT DRAWN	✓

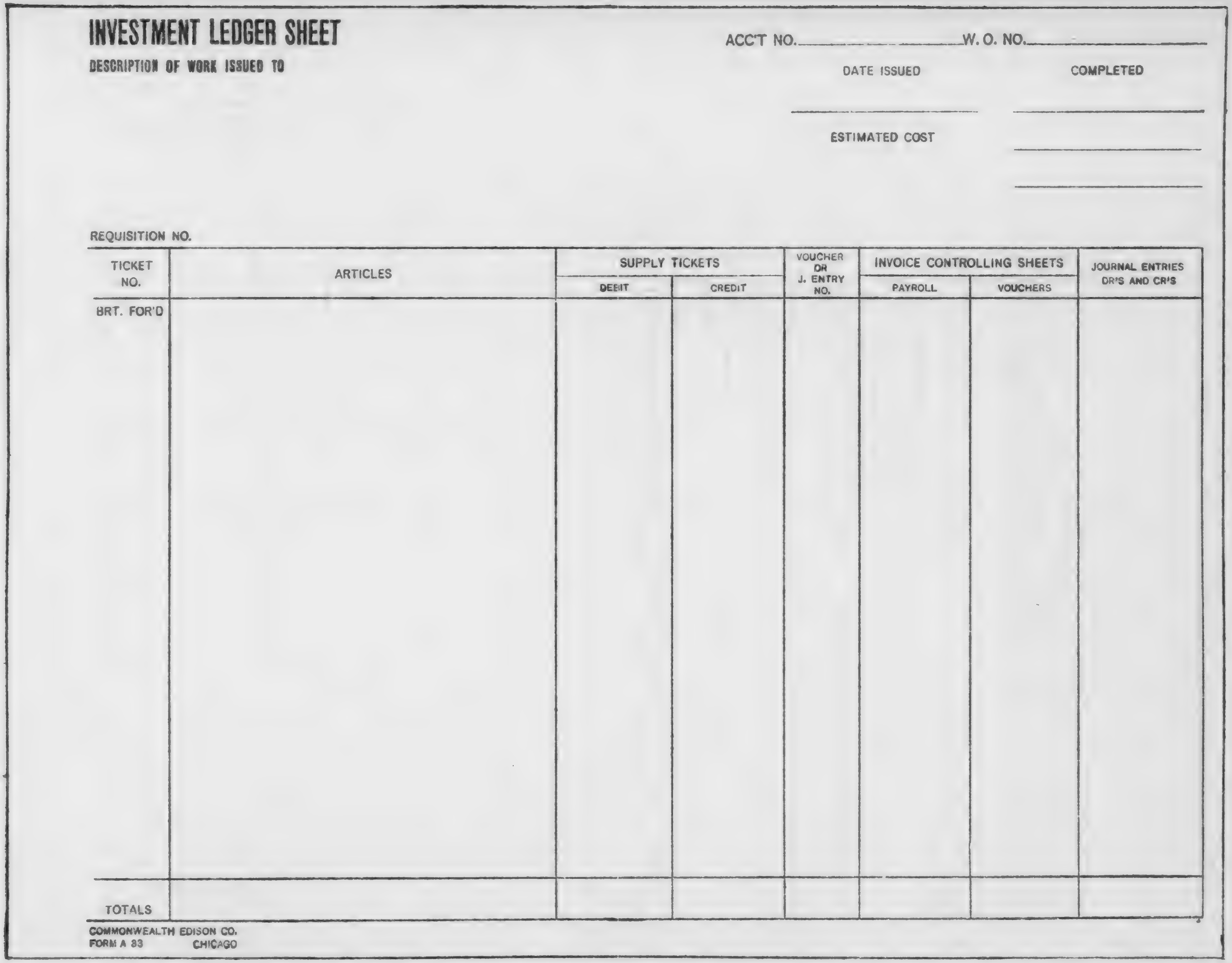
WITHDRAWALS

VOUCHER NO.	CHECK N.O	ILLINOIS MERCHANTS TRUST COMPANY	CONTINENTAL & COMMERCIAL NATIONAL BANK AND NATIONAL CITY BANK OF NEW YORK	CENTRAL TRUST COMPANY OF ILLINOIS AND FIRST NATIONAL BANK OF NEW YORK	THE NORTHERN TRUST COMPANY AND THE NATIONAL BANK OF COMMERCE NEW YORK	PEOPLES TRUST & SAVINGS BANK	HARRIS TRUST & SAVINGS BANK

FOR MONTH OF ____________________ 19____

CHICAGO TRUST CO	NATIONAL CITY BANK OF NEW YORK					

FORM 17. Bank Register or Record of Cash Disbursements for each bank, 24½" x 11", entries being made with an Elliott-Fisher Bookkeeping Machine.



INVESTMENT LEDGER SHEET

DESCRIPTION OF WORK ISSUED TO

ACC'T NO.__________ W. O. NO.__________

DATE ISSUED __________ COMPLETED __________

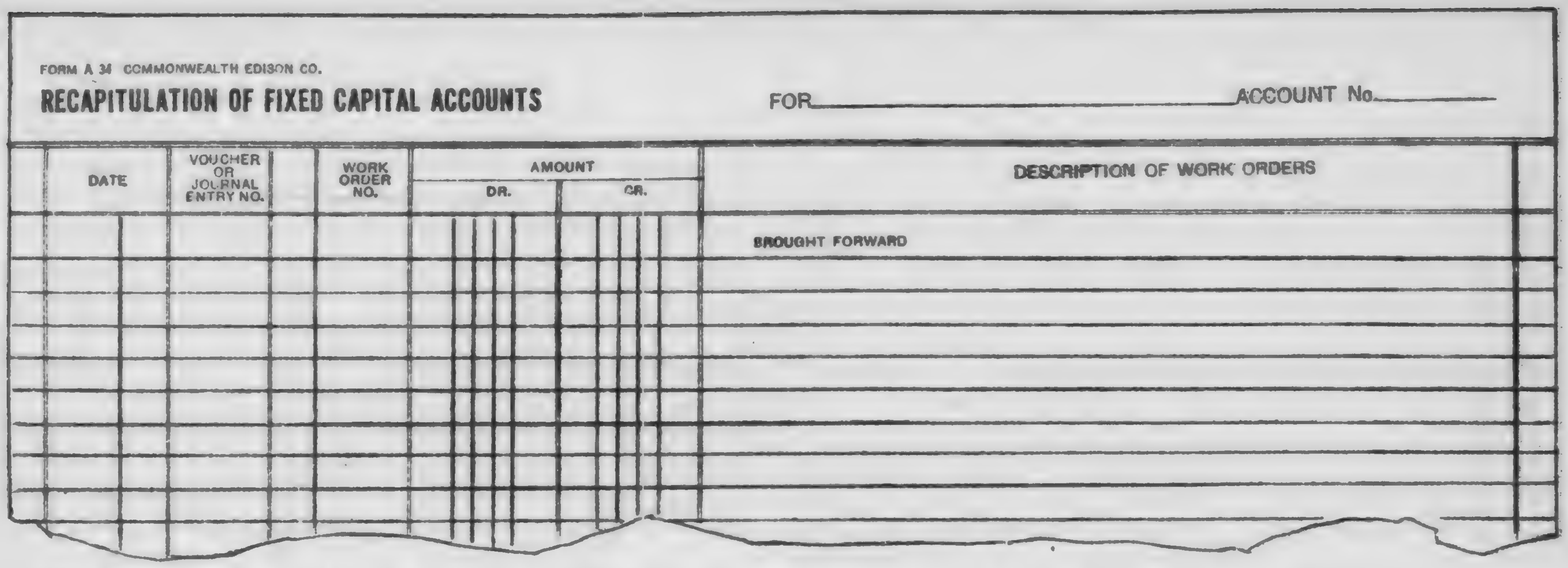
ESTIMATED COST __________

REQUISITION NO.

TICKET NO.	ARTICLES	SUPPLY TICKETS		VOUCHER OR J. ENTRY NO.	INVOICE CONTROLLING SHEETS		JOURNAL ENTRIES DR'S AND CR'S
		DEBIT	CREDIT		PAYROLL	VOUCHERS	
BRT. FOR'D							
TOTALS							

COMMONWEALTH EDISON CO.
FORM A 83 CHICAGO

FORM 18. Investment Ledger Sheet, (Work-Order Ledger) 11" x 8½", entries being made with a bookkeeping machine.



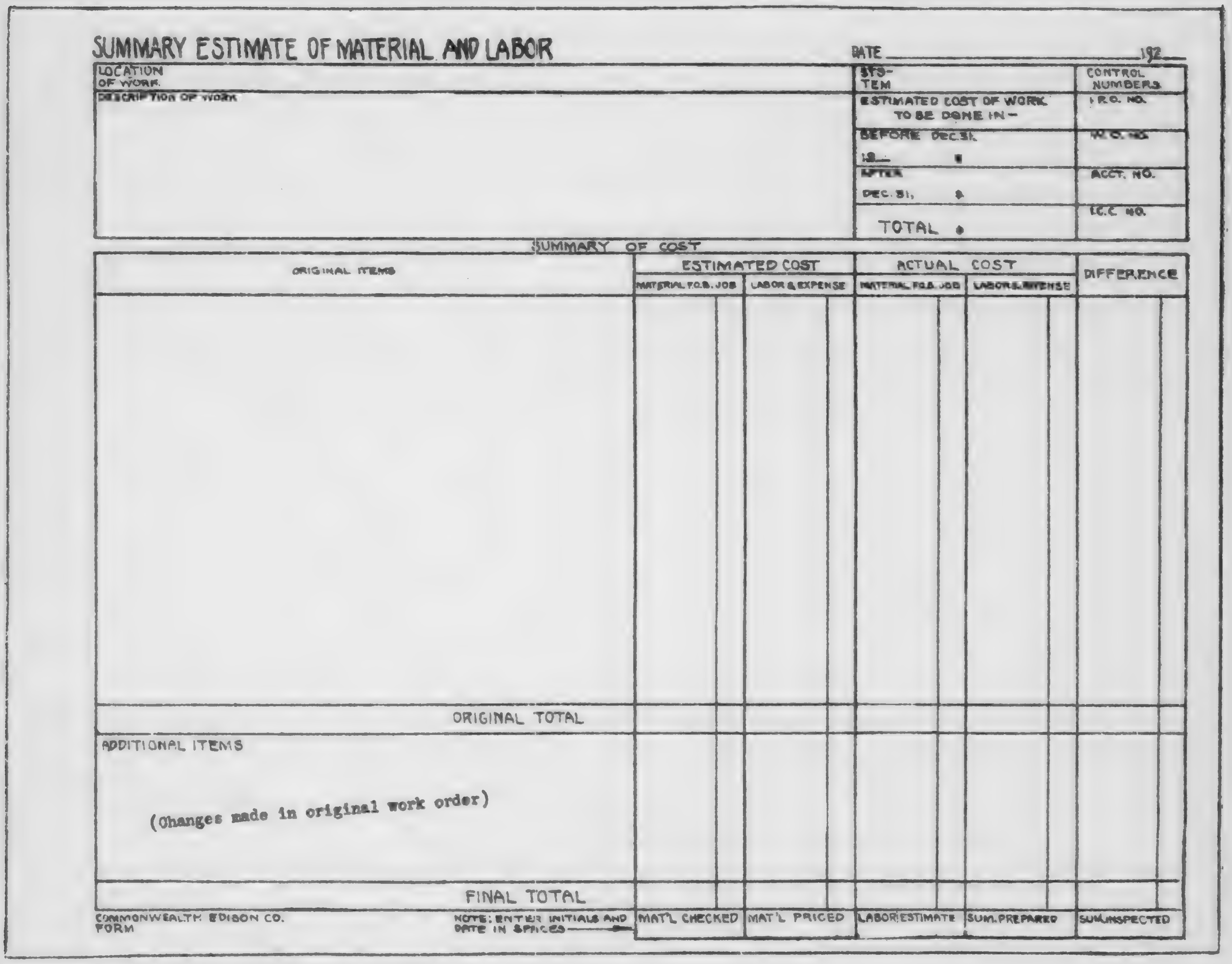
FORM A 34 COMMONWEALTH EDISON CO.

RECAPITULATION OF FIXED CAPITAL ACCOUNTS

FOR ______________________ ACCOUNT No. __________

DATE	VOUCHER OR JOURNAL ENTRY NO.	WORK ORDER NO.	AMOUNT DR.	AMOUNT CR.	DESCRIPTION OF WORK ORDERS
					BROUGHT FORWARD

FORM 19. Fixed - Capital - Account Ledger, 11" x 10 1/2", punched for loose-leaf binder.



SUMMARY ESTIMATE OF MATERIAL AND LABOR

DATE ______________ 192__

LOCATION OF WORK

DESCRIPTION OF WORK

SYSTEM

ESTIMATED COST OF WORK TO BE DONE IN—

BEFORE DEC. 31, 19__ $

AFTER DEC. 31, $

TOTAL $

CONTROL NUMBERS

I.R.O. NO.

W.O. NO.

ACCT. NO.

I.C.C. NO.

SUMMARY OF COST

ORIGINAL ITEMS	ESTIMATED COST MATERIAL F.O.B. JOB	ESTIMATED COST LABOR & EXPENSE	ACTUAL COST MATERIAL F.O.B. JOB	ACTUAL COST LABOR & EXPENSE	DIFFERENCE
ORIGINAL TOTAL					
ADDITIONAL ITEMS (Changes made in original work order)					
FINAL TOTAL					

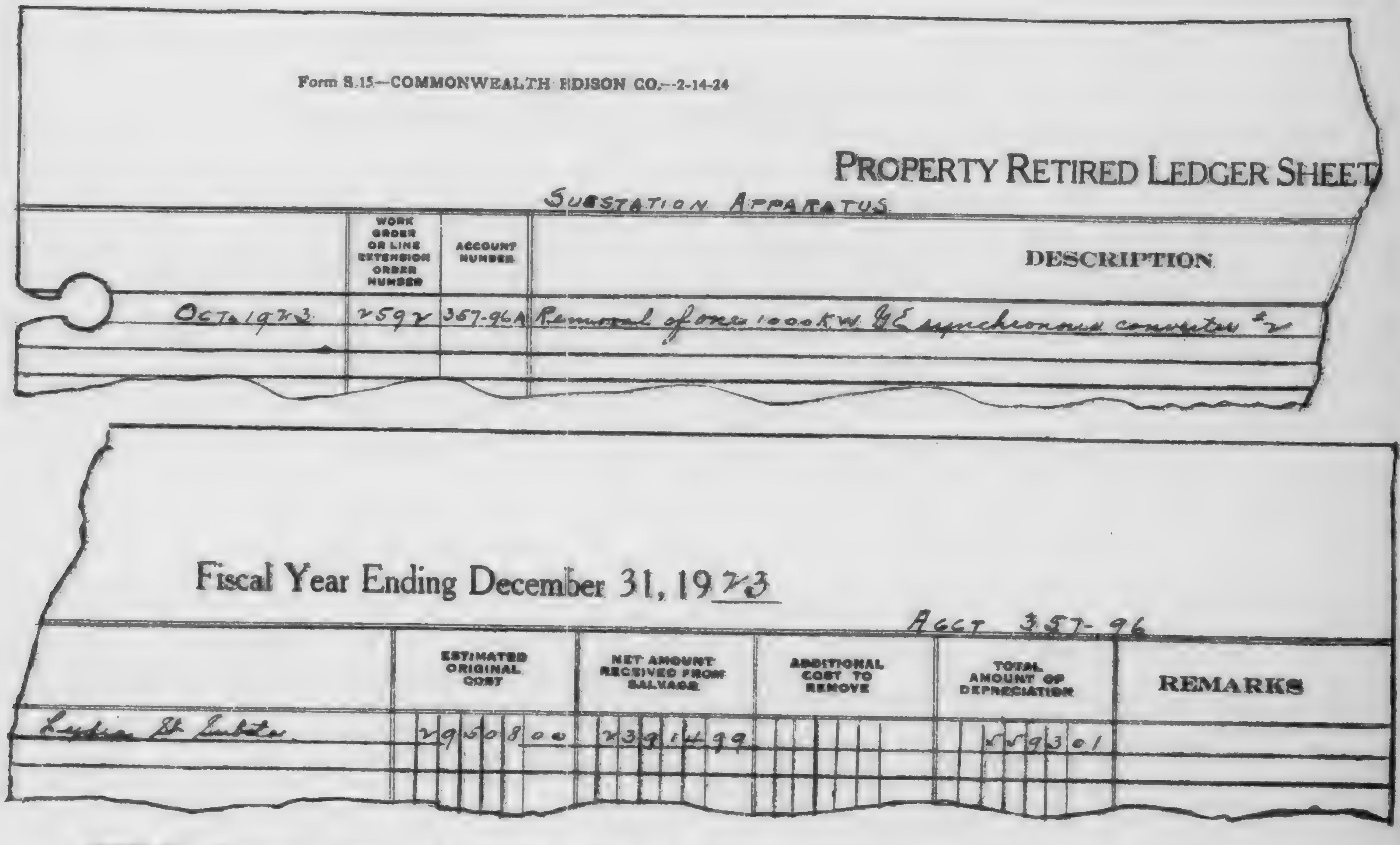
COMMONWEALTH EDISON CO. FORM

NOTE: ENTER INITIALS AND DATE IN SPACES ——→

MAT'L CHECKED	MAT'L PRICED	LABOR ESTIMATE	SUM. PREPARED	SUM. INSPECTED

FORM 20. Estimate of Material and Labor, 11" x 8½"

This is an analysis of construction costs, to be preserved for use in determining original cost when retirements are made.



Form S.15—COMMONWEALTH EDISON CO.—2-14-24

PROPERTY RETIRED LEDGER SHEET

SUBSTATION APPARATUS

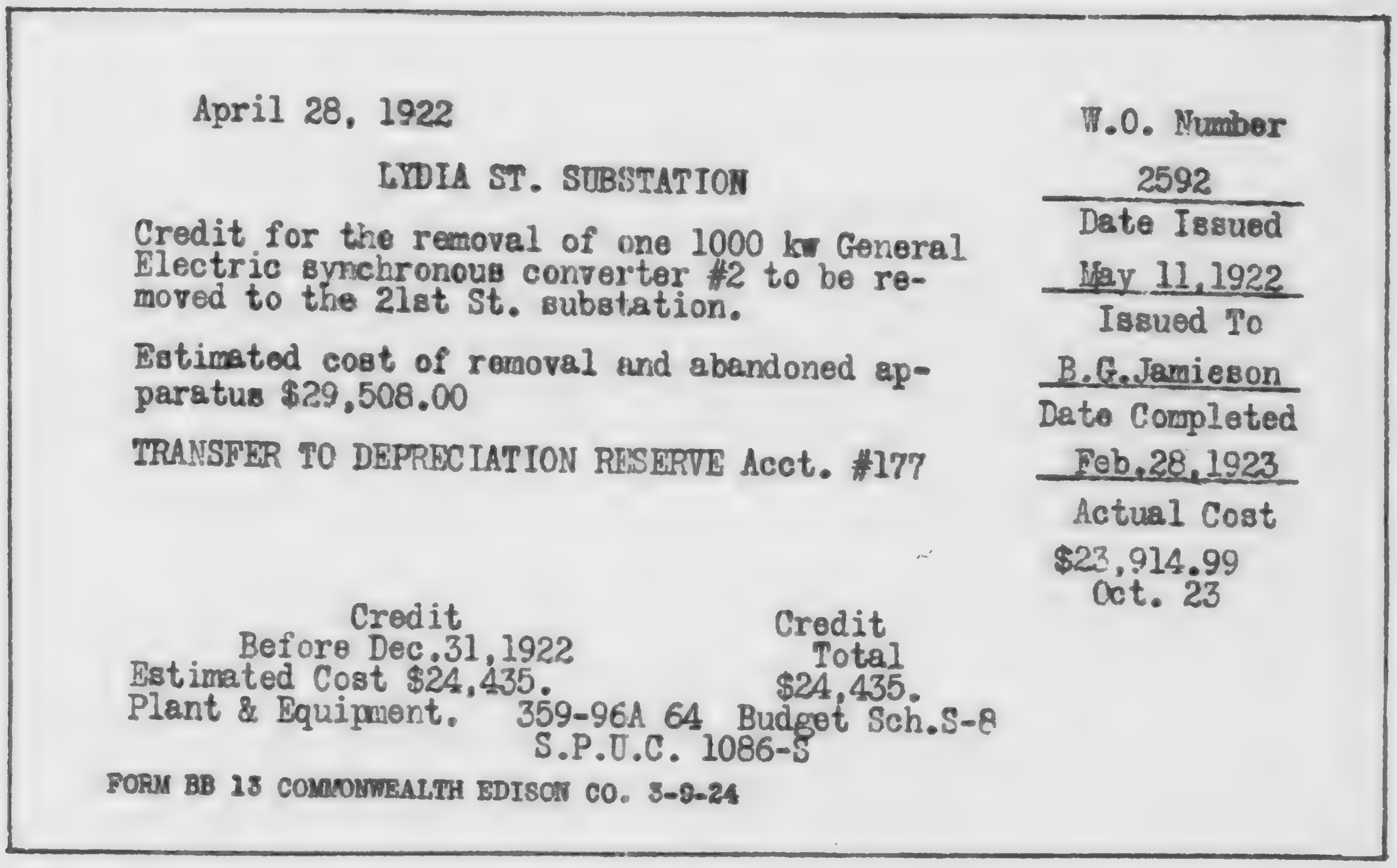
	WORK ORDER OR LINE EXTENSION ORDER NUMBER	ACCOUNT NUMBER	DESCRIPTION
Oct. 1923	2592	357-96A	Removal of one 1000 K.W. G.E. synchronous converter #2

Fiscal Year Ending December 31, 1923

ACCT 357-96

	ESTIMATED ORIGINAL COST	NET AMOUNT RECEIVED FROM SALVAGE	ADDITIONAL COST TO REMOVE	TOTAL AMOUNT OF DEPRECIATION	REMARKS
Lydia St. Substa.	29508 00	23914 99		5593 01	

FORM 21. Property Retired Ledger Sheet, 19" x 11", punched for loose-leaf binder.



April 28, 1922

LYDIA ST. SUBSTATION

Credit for the removal of one 1000 kw General Electric synchronous converter #2 to be removed to the 21st St. substation.

Estimated cost of removal and abandoned apparatus $29,508.00

TRANSFER TO DEPRECIATION RESERVE Acct. #177

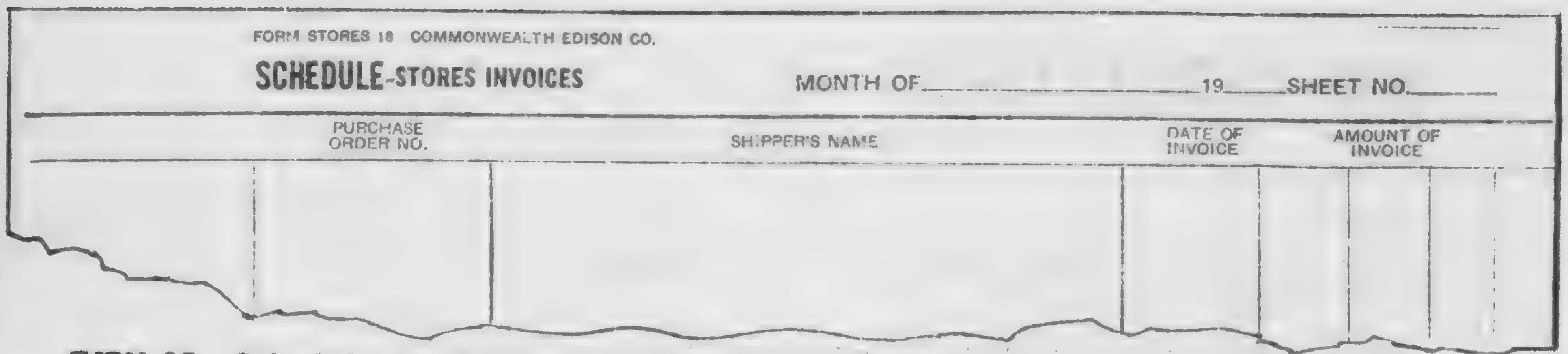
W.O. Number
2592
Date Issued
May 11, 1922
Issued To
B.G.Jamieson
Date Completed
Feb.28,1923
Actual Cost
$23,914.99
Oct. 23

Credit Before Dec.31,1922	Credit Total
Estimated Cost $24,435.	$24,435.

Plant & Equipment. 359-96A 64 Budget Sch.S-8
S.P.U.C. 1086-S

FORM BB 13 COMMONWEALTH EDISON CO. 3-9-24

FORM 22. Details of Property Retired, kept on cards 6" x 4", and filed.

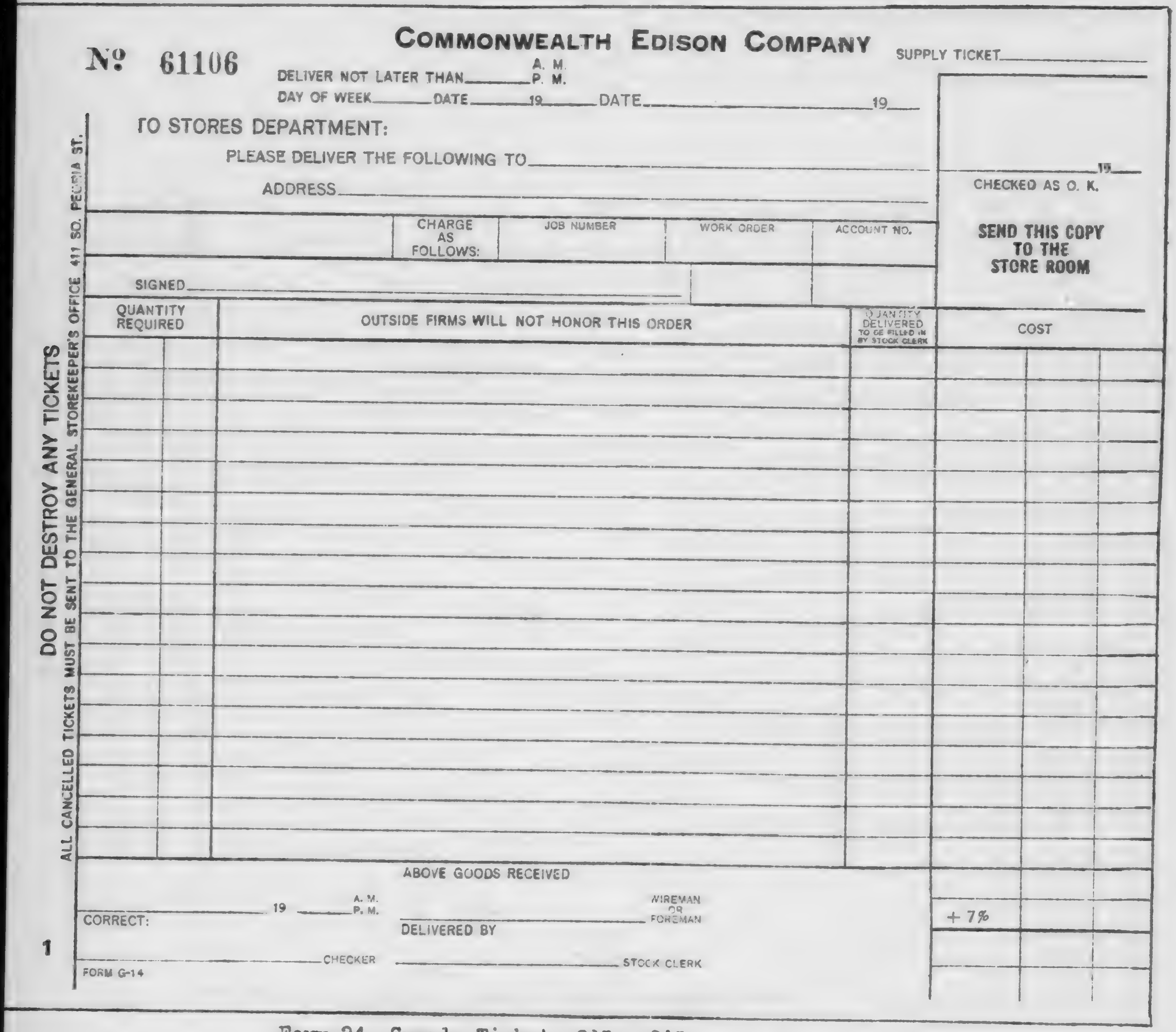


FORM STORES 18 COMMONWEALTH EDISON CO.

SCHEDULE-STORES INVOICES MONTH OF____________19____SHEET NO.______

PURCHASE ORDER NO.	SHIPPER'S NAME	DATE OF INVOICE	AMOUNT OF INVOICE

FORM 23. Schedule of Stores Invoices, 8½" x 13½", punched for loose-leaf binder.



COMMONWEALTH EDISON COMPANY

Nº 61106

SUPPLY TICKET__________

DELIVER NOT LATER THAN______A. M. P. M.

DAY OF WEEK______DATE______19____DATE____________19____

TO STORES DEPARTMENT:

PLEASE DELIVER THE FOLLOWING TO____________

ADDRESS____________

________19____

CHECKED AS O. K.

SEND THIS COPY TO THE STORE ROOM

	CHARGE AS FOLLOWS:	JOB NUMBER	WORK ORDER	ACCOUNT NO.
SIGNED________				

QUANTITY REQUIRED	OUTSIDE FIRMS WILL NOT HONOR THIS ORDER	QUANTITY DELIVERED TO BE FILLED IN BY STOCK CLERK	COST
			+ 7%

ABOVE GOODS RECEIVED

CORRECT: __________19 ______A. M. P. M.

____________WIREMAN OR FOREMAN

DELIVERED BY

____________CHECKER ____________STOCK CLERK

FORM G-14

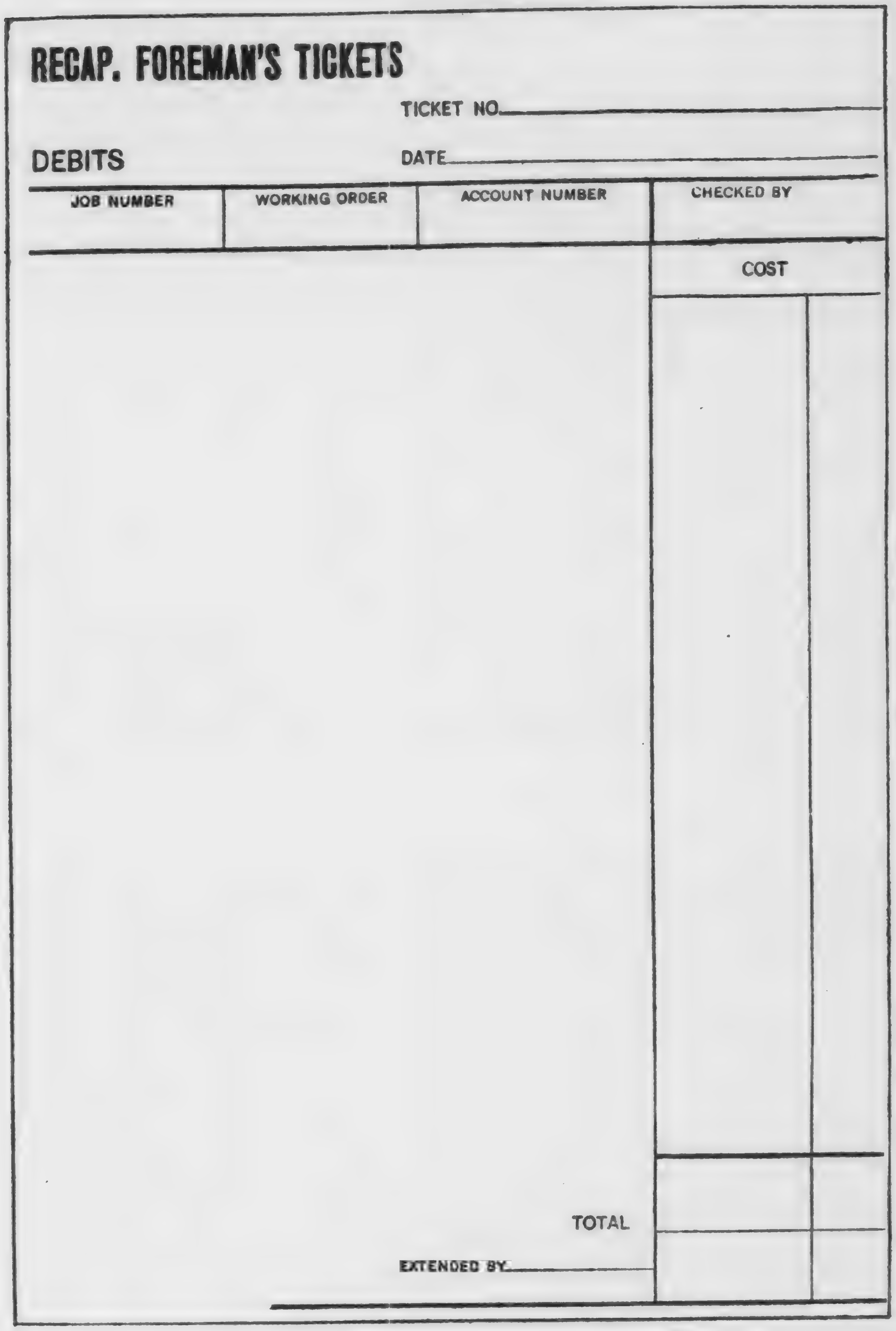
DO NOT DESTROY ANY TICKETS

ALL CANCELLED TICKETS MUST BE SENT TO THE GENERAL STOREKEEPER'S OFFICE 411 SO. PEORIA ST.

1

Form 24. Supply Ticket, 8¼" x 8¼", made out in six copies as follows:

1. For cost department
2. For storeroom
3. Forwarded with material to the job
4. Sent to inside plant division
5. Sent to construction dept. office
6. Retained by department issuing order



RECAP. FOREMAN'S TICKETS

TICKET NO.________________

DEBITS

DATE________________

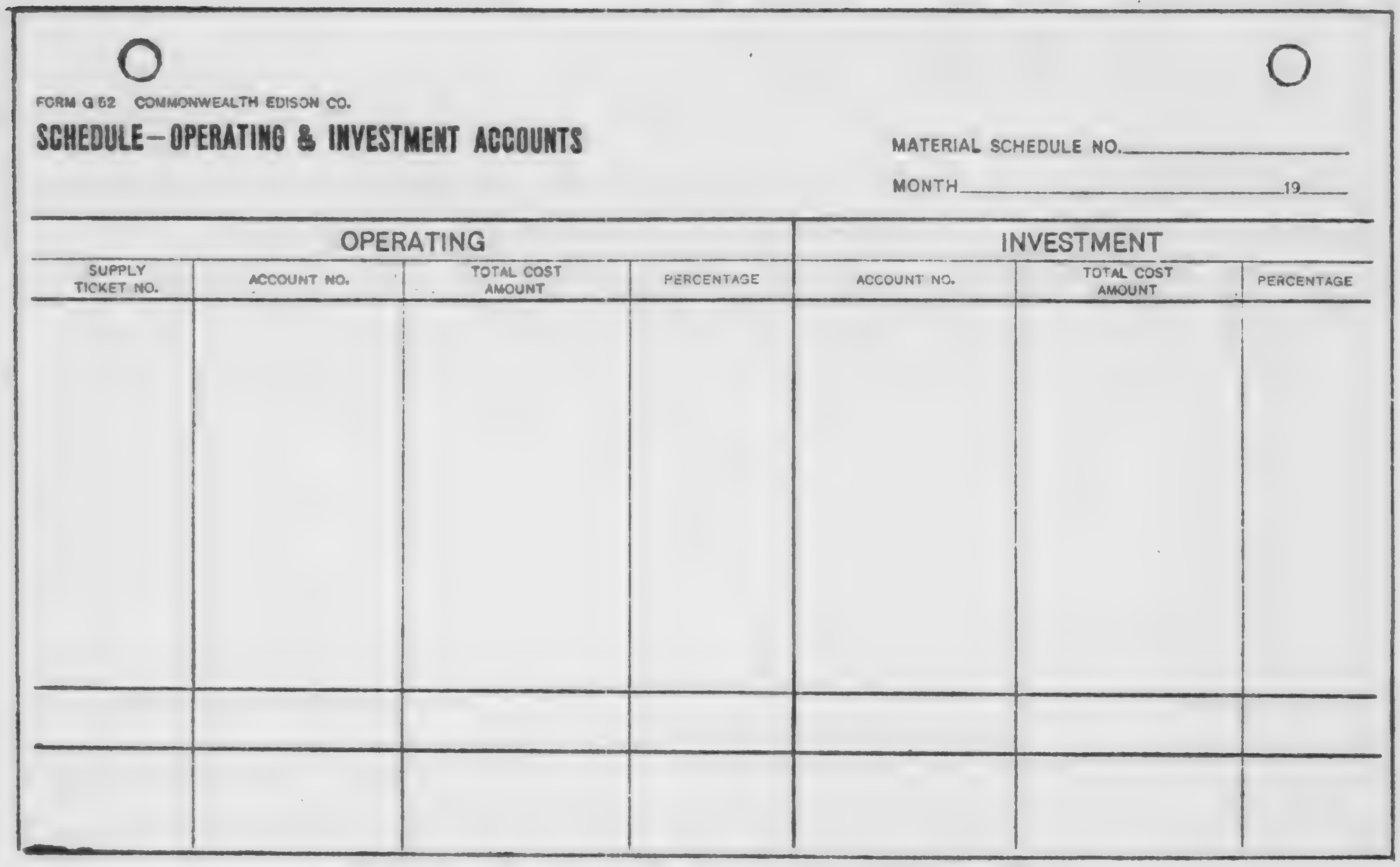
JOB NUMBER	WORKING ORDER	ACCOUNT NUMBER	CHECKED BY

COST

TOTAL

EXTENDED BY________________

FORM 25. Recapitulation of Supply Tickets, 4" x 7¾".



FORM G 52 COMMONWEALTH EDISON CO.

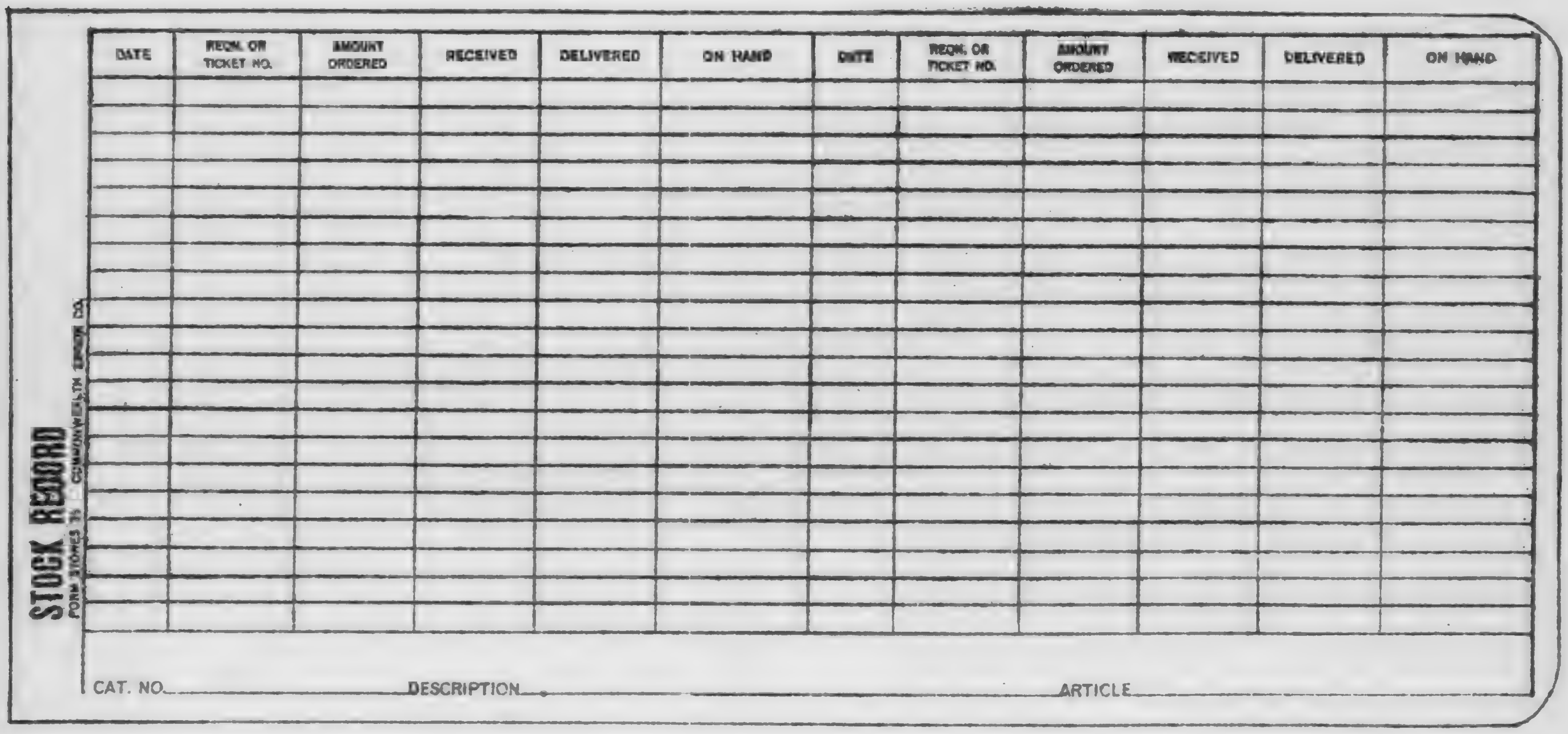
SCHEDULE—OPERATING & INVESTMENT ACCOUNTS

MATERIAL SCHEDULE NO.__________

MONTH__________19___

OPERATING				INVESTMENT		
SUPPLY TICKET NO.	ACCOUNT NO.	TOTAL COST AMOUNT	PERCENTAGE	ACCOUNT NO.	TOTAL COST AMOUNT	PERCENTAGE

FORM 26. Schedule of Supply Tickets for Operating and Investment Accounts, 8½" x 13½".



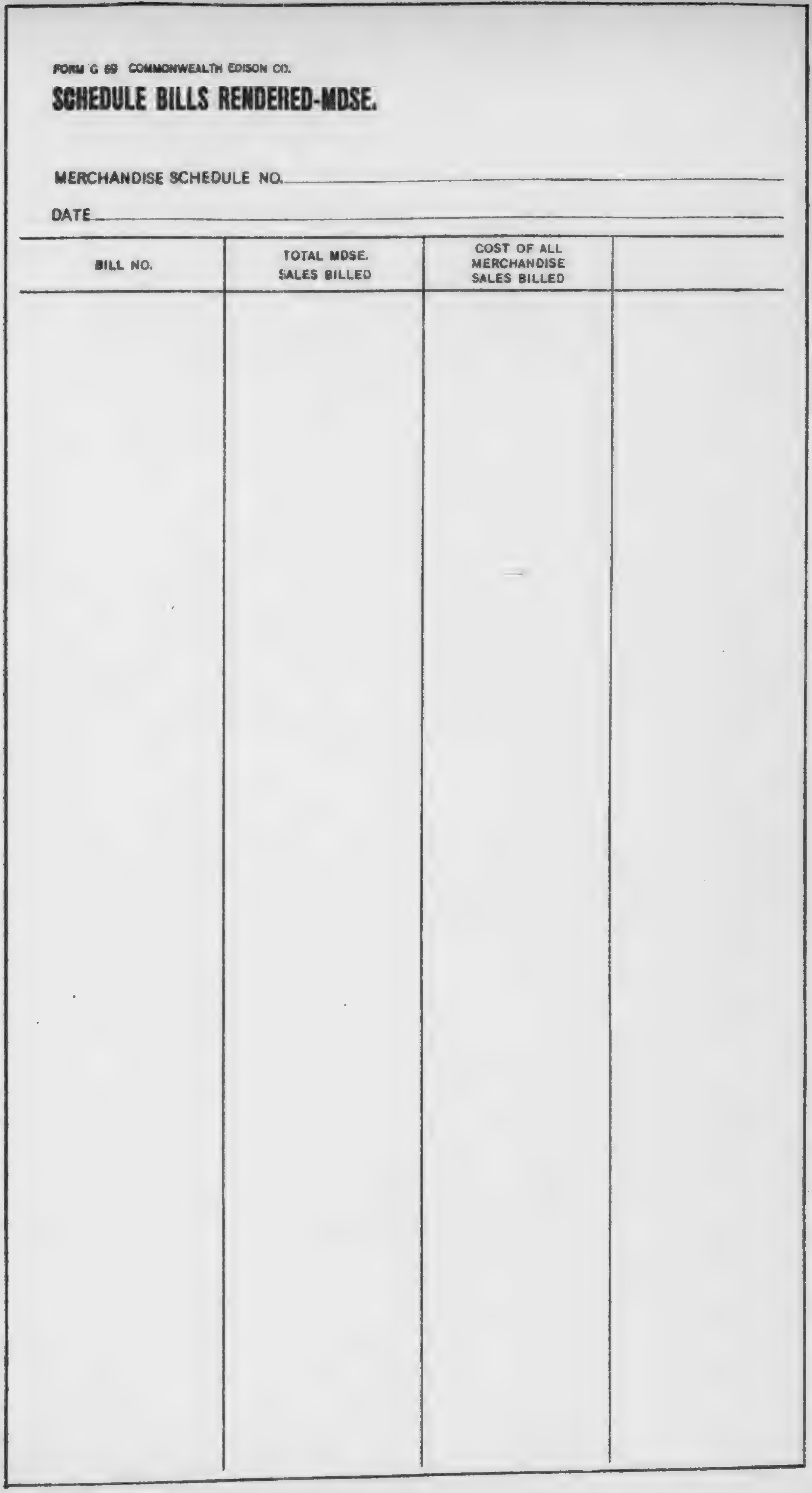
STOCK RECORD

FORM STORES 75 COMMONWEALTH EDISON CO.

DATE	REQN. OR TICKET NO.	AMOUNT ORDERED	RECEIVED	DELIVERED	ON HAND	DATE	REQN. OR TICKET NO.	AMOUNT ORDERED	RECEIVED	DELIVERED	ON HAND

CAT. NO.__________ DESCRIPTION__________ ARTICLE__________

FORM 27. Stock Record, 10½" x 4½".



FORM G 69 COMMONWEALTH EDISON CO.

SCHEDULE BILLS RENDERED-MDSE.

MERCHANDISE SCHEDULE NO.____________________

DATE____________________

BILL NO.	TOTAL MDSE. SALES BILLED	COST OF ALL MERCHANDISE SALES BILLED	

FORM 28. Schedule of Bills Rendered, 5½" x 13".

APPENDIX B

ANNUAL REPORT OF AN ELECTRIC UTILITY
as Required by the
ILLINOIS COMMERCE COMMISSION

FORM 11

ANNUAL REPORT

OF

For the Year Ended December 31, 1924

TO THE

Illinois Commerce Commission

SPRINGFIELD, ILLINOIS

FRANK L. SMITH, Chairman
CICERO J. LINDLY
HAL. W. TROVILLION
P. H. MOYNIHAN
WM. J. SMITH
WM. BURKHARDT
EDW. H. WRIGHT, Commissioners

JULIUS JOHNSON, Secretary
FRANK A. HEERMANS, Assistant Secretary
C. G. BENNETT, Chief Engineer
H. M. SLATER, Transportation Rate Expert
W. M. HAMMOND, Chief Accountant
H. E. WOOD, Supervisor of Orders

Received for Filing________________, 1925.

Officer to whom correspondence concerning this report should be addressed:

Name ________________ Title________________ Address ________________

21981—450 Books JEFFERSONS PRINTING CO. SPRINGFIELD, ILLINOIS

NOTICE

1. This Form for Annual Report should be filled out in duplicate; one copy to be returned to the office of the ILLINOIS COMMERCE COMMISSION, Springfield, Illinois, by March 31, 1925, and one copy to be retained in the files of the respondent. Attention is directed to the provisions of Section 19 of an act concerning public utilities, approved June 29, 1921:

> "Sec. 19. Each public utility in the State shall each year furnish to the Commission, in such form as the Commission shall require, annual reports as to all the items mentioned in the preceding sections of this article, and in addition such other items, whether of a nature similar to those therein enumerated or otherwise, as the Commission may prescribe. Such annual reports shall contain all the required information for the period of twelve months ending on the thirtieth day of June in each year, or ending on the thirty-first day of December in each year, as the Commission may by order prescribe for each class of public utilities, and shall be filed with the Commission at its office in Springfield within three months after the close of the year for which the report is made. The Commission shall have authority to require any public utility to file monthly reports of earnings and expenses of such utility, and to file other periodical or special, or both periodical and special reports concerning any matter about which the Commission is authorized by law to keep itself informed. **ALL REPORTS SHALL BE UNDER OATH.**
>
> When any report is erroneous or defective or appears to the Commission to be erroneous or defective, the Commission may notify the public utility to amend such report within thirty days, and before or after the termination of such period the Commission may examine the officers, agents or employees and books, records, accounts, vouchers, plant, equipment, and property of such public utility, and correct such items in the report as upon such examination the Commission may find defective or erroneous. * * * * * * * * * *
>
> Any public utility which fails to make and file any report called for by the Commission within the time specified; or to make specific answer to any question propounded by the Commission within thirty days from the time it is lawfully required to do so, or within such further time, not to exceed ninety days, as may in its discretion be allowed by the Commission, shall forfeit $100 for each and every day it may so be in default.
>
> Any person who wilfully makes any false return or report to the Commission, or to any member, officer, or employee thereof, and any person who aids or abets such person, shall, upon conviction, be subject to imprisonment in the county jail not exceeding one year, or to a fine not exceeding one thousand dollars, or both."

2. **Every inquiry contained in this annual report must be definitely answered.** Where the word "none" truly and completely states the fact it should be given as the answer to any particular inquiry or any particular portion of an inquiry. Except in cases where they are specially authorized, cancellations, arbitrary check marks, and the like, must not be used either as partial or as entire answers to inquiries.

3. If it is necessary or desirable to insert additional statements, typewritten or other, in a report, care should be taken that they be legibly made on paper of a durable sort, and as a rule, of a size not exceeding that of a page. Inserted sheets should be securely attached, preferably at the inner margin For the purpose of this report the word "Corporation" should, in all appropriate cases, be construed as including joint stock companies, associations, firms, or individuals.

4. The respondent company is requested to send to the Commission two copies of its latest printed annual report to stockholders.

5. This report must not include accounts of Electric Railways where separate books are kept and reports are made in full in annual report form 2 for electric railways. Such accounts are to be reported herein only where books have been so kept that a separation cannot be made as between electric railway investment and operation, and electric, gas, heating and water utility investment and operations.

Section 1

CORPORATE HISTORY AND CONTROL
BALANCE SHEET
INCOME ACCOUNT
PROFIT AND LOSS ACCOUNT

1

HISTORY AND CONTROL.

1. Exact name of company making this report.
(Use word "The" only when part of corporate title.)

2. Date of incorporation. If not incorporated give date of organization.

3. Under laws of what State incorporated?

4. If a consolidated company, name the constituent companies.

5. Date and authority for each consolidation.

6. If a reorganized company, give name of original corporation and refer to laws under which it was organized.

7. Date of last meeting of stockholders for election of directors.

8. Total number of stockholders December 31, 1924.

9. Has each share of stock one vote? If otherwise, explain voting rights.

10. Has any issue of securities contingent voting rights? If so, explain character of such rights.

11. Has any issue of securities special privileges in the election of directors? If so, explain character of such privileges.

12. Did any other corporation, or corporations, control the respondent on December 31, 1924? If control was so held, state:

(*a*) The form of control, whether sole or joint;

(*b*) The name of the controlling corporation or corporations;

(*c*) The manner in which control was established;

(*d*) The extent of control;

(*e*) Whether control was direct or indirect;

(*f*) The name of the intermediary through which control, if indirect, was established.

13. Corporations controlled by respondent.

DIRECTORS.

Line No.	Name of Director. (a)	Office Address. (b)	Term Expires. (c)
21			
22			
23			
24			
25			
26			
27			

OFFICERS.

Line No.	Title of General Officer. (a)	Name and office address of person holding office at close of year. (b)
31	President,	
32	Secretary,	
33	Treasurer,	
34	Auditor,	
35	General Manager,	
36	Chief Engineer,	
37		

38. Where are general Books and Records of Accounts kept?

39. Give name of officer in charge of same.

40. When does your fiscal year close?

41. Is the period covered by this report the calendar year ended December 31, 1924? If not, state exact period covered and reason therefor.

SECURITY HOLDERS AND VOTING POWER.

9. In the schedule below show the particulars called for concerning the members of the respondent who at the date of the latest closing of the stock-book of the respondent prior to the actual filing of this report had the twenty highest voting powers in the respondent. If any such holder held in trust, attach a statement showing the particulars of the trust. If the stock book was not closed within one year, show such twenty members as of the close of the year.

Line No.	Name of member.	Address of member.	Number of votes to which member was entitled.	Par value of securities through holding which the voting power was had.			
				Stocks.			Other securities with voting power.
				Common.	Preferred.		
					Second.	First.	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)
1				$	$	$	$
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

IMPORTANT CHANGES DURING THE YEAR.

Here present statements as follows: Every item must be fully answered, and if there have been no changes that fact should be stated.

(The important Physical Changes during the year should be enumerated in the separate reports for the departments affected.)

1. All Consolidations or Reorganizations effected.

2. All changes in the respondent's holdings of Stocks and Funded Debt.

3. All other important Financial Changes.

4. All New Franchises Acquired.

5. All Leases Taken or Surrendered.

COMPARATIVE GENERAL BALANCE SHEET.

Show the items of assets of the respondent as of the beginning and those as of the close of the year, classified in accordance with the Uniform Classifications of Accounts for Electric, Gas, Heating and Water Utilities, and for each item or total show the net change during the year, showing net increases in black ink and net decreases in red ink.

The entries in column (a) should correspond with the figures in the previous year's report.

The entries must be consistent with the details shown on the pages indicated.

Line No.	Balance at beginning of year. (a)	ASSETS. (b)	Balance at close of year. (c)	Increase or Decrease. (d)
1		101. Fixed Capital, page 8,		
2		CURRENT ASSETS:		
3		111. Cash,		
4		112. Notes Receivable		
5		113. Accounts Receivable, page 10,		
6		114. Interest and Dividends Receivable,		
7		115. Marketable Securities, page 10,		
8		116. Materials and Supplies,		
9		117. Prepayments, page 10,		
10		118. Subscribers to Capital Stock,		
11		119. Miscellaneous Current Assets, page 10,		
12		Total Current Assets,		
13		MISCELLANEOUS ASSETS:		
14		121. Investments in Affiliated Companies, page 11,		
15		122. Miscellaneous Investments, page 12,		
16		123. Sinking Funds, page 13,		
17		124. Replacement Fund, page 13,		
18		125. Miscellaneous Special Funds, page 13,		
19		126. Special Deposits, page 14,		
20		Total Miscellaneous Assets,		
21		DEFERRED DEBITS:		
22		131. Unamortized Debt Discount and Expense, page 16,		
23		132. Property Abandoned, page 12,		
24		133. Jobbing Accounts,		
25		134. Clearing or Apportionment Accounts,		
26		135. Work in Progress,		
27		136. Miscellaneous Deferred Debits, page 14,		
28		Total Deferred Debits,		
29		ADJUSTMENT ACCOUNTS:		
30		141. Discount on Capital Stock, page 15,		
31		142. Reacquired Securities, pages 15, 16,		
32		143. Treasury Securities, pages 15, 16,		
33		TOTAL ASSETS,		

COMPARATIVE GENERAL BALANCE SHEET.

Show the items of liabilities of the respondent as of the beginning and those of the close of the year, classified in accordance with the Uniform Classifications of Accounts for Electric, Gas, Heating and Water Utilities, and for each item or total show the net change during the year, showing net increases in black ink and net decreases in red ink.

The entries in column (a) should correspond with the figures in the previous year's report.

The entries must be consistent with details shown on the pages indicated.

Line No.	Balance at beginning of year. (a)	LIABILITIES (b)	Balance at close of year. (c)	Increase or Decrease. (d)
1	$ c.	201. Capital Stock, page 15,	$ c.	$ c.
2		202. Premium on Capital Stock, page 15,		
3		203. Capital Stock Subscribed,		
4		211. Long Term Debt, page 16,		
5		212. Receiver's Certificates, page 16,		
6		CURRENT LIABILITIES:		
7		221. Notes Payable, page 17,		
8		222. Accounts Payable,		
9		223. Consumers' Deposits,		
10		224. Matured Interest Unpaid,		
11		225. Dividends Declared, page 18,		
12		226. Matured Long Term Debt Unpaid,		
13		227. Miscellaneous Current Liabilities, page 21,		
14		Total Current Liabilities,		
15		ACCRUED LIABILITIES:		
16		231. Taxes Accrued, page 24,		
17		232. Interest Accrued,		
18		233. Miscellaneous Accrued Liabilities, page 21,		
19		Total Accrued Liabilities,		
20		241. Advances from Affiliated Companies, page 18,		
21		RESERVES:		
22		251. Retirement Reserve, page 19,		
23		252. Casualty and Insurance Reserve, page 20,		
24		253. Unamortized Premium on Debt, page 16,		
25		254. Sinking Fund Reserves, page 20,		
26		255. Contributions for Extensions, page 20,		
27		256. Contingency Reserve, page 20,		
28		257. Miscellaneous Reserves, page 20,		
29		Total Reserves,		
30		261. Miscellaneous Unadjusted Credits, page 21,		
31		270. Profit and Loss—Balance, page 23,		
32				
33		TOTAL LIABILITIES,		

3

FIXED CAPITAL.

[illegible]

Show hereunder a summary of the Fixed Capital of the respondent assignable to Account No. 101.

If the respondent conducts two or more kinds of operations, (such as electric and gas) and the fixed capital installed prior to January 1, 1923 (the effective date of the Uniform Classification of Accounts for such operations) cannot be segregated to show separately the total amount assignable to electric, gas, heating, water and other classes of investment indicated, the total investment of the respondent at beginning of year should be shown on line 9.

If the fixed capital installed prior to January 1, 1923, has been reclassified during the year in accordance with the prescribed accounts, the entire investment may be classified under fixed capital changes during the year. Attention should be directed in a footnote to the fact that such reclassification has been made.

Line No.	ITEM. (a)	Amount (b) $	c.
1	FIXED CAPITAL AT BEGINNING OF YEAR:		
2	Electric,		
3	Gas,		
4	Heating,		
5	Water,		
6	Electric Railroad,		
7	Other Departments,		
8	General (see text of Account No. 101),		
9	Total Fixed Capital at beginning of year,		
10	FIXED CAPITAL CHANGES DURING YEAR:*		
11	Electric, page E3,		
12	Gas, page G3,		
13	Heating, page H2,		
14	Water, page W3,		
15	Electric Railroad—Form 2,		
16	Other Departments, page 9,		
17	General, page 9 (see text of Account No. 101),		
18	Total net increase (or decrease) during year,		
19	Fixed Capital at close of year (Acct. 101),		

* Show increases in black and decreases in red.

REMARKS

FIXED CAPITAL CHANGES DURING YEAR—OTHER DEPARTMENTS.

Show the particulars called for concerning the fixed capital of the respondent in departments other than electric, gas, heating and water.

Line No.	DEPARTMENT. (a)	Fixed Capital installed during year. (b)	Fixed Capital retired during year. (c)	Adjustments during year. (d)	Net Change* during year. (e)
1	Electric Railway,	$ c.	$ c.	$ c.	$ c.
2	Ice,				
3	Other (specify),				
4					
5					
6	Total,				

* Show increases in black, decreases in red.

FIXED CAPITAL, GENERAL—CHANGES DURING YEAR.

If expenditures for fixed capital devoted to two or more classes of operations are not apportioned to the various departments interested, show hereunder the changes during the year in fixed capital not assignable to any particular department.

If such expenditures are apportioned, that fact should be noted and the basis of the apportionment stated in a footnote.

Line No.	Name of Account. (a)	Fixed Capital installed during year. (b)	Fixed Capital retired during year. (c)	Adjustments during year. (d)	Net Change during year. (e)
11		$ c.	$ c.	$ c.	$ c.
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24	Total,				

ACCOUNTS RECEIVABLE.

Classify hereunder, accounts receivable as carried in balance sheet account No. 113. Accounts with affiliated companies should include those accounts subject to current settlement, but not amounts classifiable as investment advances.

Line No.	DESCRIPTION. (a)	Amount. (b)
1	Consumers' Accounts.	$ c.
2	Accounts with affiliated Companies.	
3	Miscellaneous accounts receivable.	
4		
5	Total,	

MARKETABLE SECURITIES.

Line No.	Description of Security. (a)	Interest or Dividends. Rate (b)	Interest or Dividends. Amount. (c)	Par Value. (d)	Cost or Book Value. (e)
10			$ c.	$ c.	$ c.
11					
12					
13					
14					
15					
16	Total.				

PREPAYMENTS.

Line No.	Description. (a)	Amount. (b)
20		$ c.
21		
22		
23		
24		
25		
26		
27		
28	Total.	

MISCELLANEOUS CURRENT ASSETS.

Line No.	Description. (a)	Amount. (b)
30		$ c.
31		
32		
33		
34		
35		
36		
37		
38		
39		
40	Total.	

INVESTMENTS IN AFFILIATED COMPANIES.

Line No.	Name of Company and Security. (a)	Pledged.		Unpledged.		Total Cost or Book Value. (f)	Interest or Dividends.	
		Total Par Value. (b)	Cost or Book Value. (c)	Total Par Value. (d)	Cost or Book Value. (e)		Rate. (g)	Amount. (h)
1	Stocks,	$ c.	$ c.	$ c.	$ c.	$ c.		$ c.
2								
3								
4								
5								
6								
7								
8								
9								
10	Bonds,							
11								
12								
13								
14								
15								
16	Notes,							
17								
18								
19								
20								
21	Advances,							
22								
23	Total,							

ADVANCES TO AFFILIATED COMPANIES.

Line No.	NAME OF DEBTOR COMPANY. (a)	Total Amount Outstanding at Beginning of Year. (b)	Principal Advanced During Year.			Principal Repaid During Year.		Interest.		Total Amount Outstanding at Close of Year. (j)
			Amount. (c)	Date of Advance. (d)	Date of Maturity. (e)	Amount. (f)	Date of Repayment. (g)	Rate per Annum. (h)	Amount Accrued During Year. (i)	
1		$ c.	$ c.			$ c.		%	$ c.	$ c.
2										
3										
4										
5										
6										
7										
8										
9										
10										
11	Total									

MISCELLANEOUS INVESTMENTS.

Not held in Sinking or Other Special Funds.

Line No.	Description of Property or Security. (a)	Pledged. Total Par Value. (b)	Pledged. Cost or Book Value. (c)	Unpledged. Total Par Value. (d)	Unpledged. Cost or Book Value. (e)	Total Cost or Book Value. (f)	Interest, Rent or Dividends. Rate. (g)	Interest, Rent or Dividends. Amount. (h)
1	Physical property:	$ c.	$ c.	$ c.	$ c.	$ c.		$ c.
2								
3	Securities:							
4								
5								
6								
7								
8								
9								
10								
11	Miscellaneous:							
12								
13								
14								
15								
16	Total.							

PROPERTY ABANDONED.

Line No.	DESCRIPTION AND EXPLANATION. (a)	Date of Abandonment. (b)	Cost of Property Abandoned. (c)	AMOUNT WRITTEN OFF PRIOR TO BEGINNING OF YEAR. To Depreciation or Other Reserve. (d)	AMOUNT WRITTEN OFF PRIOR TO BEGINNING OF YEAR. To Operating Expense. (e)	AMOUNT WRITTEN OFF DURING YEAR. To Depreciation or Other Reserve. (f)	AMOUNT WRITTEN OFF DURING YEAR. To Operating Expense. (g)	Balance at Close of Year. (h)
			$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
41								
42								
43								
44								
45								
46	Total							

SINKING AND OTHER FUNDS.

A. ADDITIONS AND WITHDRAWALS DURING THE YEAR.

Line No.	NAME OF FUND.	ADDITIONS.				WITHDRAWALS FROM FUND.
		CASH APPROPRIATIONS TO FUND.	INCOME TO FUND FROM INVESTMENTS.	OTHER ADDITIONS TO FUND.	TOTAL.	
1	Sinking Funds:					
2						
3						
4						
5	Total.					
6	Replacement Fund:					
7						
8						
9						
10	Total.					
11	Miscellaneous Special Funds:					
12						
13						
14						
15						
16						
17						
18						
19						
20	Total.					

B. ASSETS AT CLOSE OF YEAR.

Line No.	NAME OF FUND AND SECURITY.	SECURITIES IN FUND.		CASH IN FUND.	TOTAL.
		PAR VALUE.	COST OR BOOK VALUE.		
21	Sinking Funds:				
22					
23					
24					
25					
26					
27					
28	Total.				
29	Replacement Fund:				
30					
31					
32					
33					
34					
35					
36	Total.				
37	Miscellaneous Special Funds:				
38					
39					
40					
41					
42					
43					
44					
45					
46					
47	Total.				

Note—In case the character of any item is not fully disclosed, full explanation must be made.

SPECIAL DEPOSITS.

Line No.	DESIGNATION OF DEPOSIT AND DESCRIPTION OF SECURITY OR PROPERTY. (a)	SECURITIES. Par Value. (b)	SECURITIES. Cost or Book Value. (c)	Cash. (d)	Total. (e)
		$ c.	$ c.	$ c.	$ c.
1					
2					
3					
4					
5					
6					
7					
8					
9					
10	Total.				

MISCELLANEOUS DEFERRED DEBITS.

Line No.	Description. (a)	Amount. (b)
		$ c.
11		
12		
13		
14		
15		
16		
17		
18		
19	Total,	

CAPITAL STOCK.

Line No.	KIND OF STOCK. (a)	Number of Shares Authorized. (b)	Par value of One Share. (c)	Total Par Value Authorized. (d)	Amount of Authorization Cancelled Prior to Issue. (e)	Par Value of Amount Issued. (f)	Reacquired After Issue and Cancelled. (g)	PAR VALUE OUTSTANDING. Not Held by or for Respondent. (h)	PAR VALUE OUTSTANDING. REACQUIRED. Unpledged. (i)	PAR VALUE OUTSTANDING. REACQUIRED. Pledged. (j)
1	Common,		$	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
2										
3	Preferred,									
4										
5										
6										
7										
8	Total.									

Line No.	PAR VALUE OUTSTANDING—Continued. Issued and Held in Treasury. Unpledged. (k)	PAR VALUE OUTSTANDING—Continued. Issued and Held in Treasury. Pledged. (l)	PAR VALUE OUTSTANDING—Continued. In Sinking or Other Reserve Funds. (m)	PAR VALUE OUTSTANDING—Continued. Total Par Value Outstanding (Columns h to m inclusive.) (n)	PREMIUM AND DISCOUNT ON CAPITAL STOCK. Unextinguished Premium at Beginning of Year. (o)	PREMIUM AND DISCOUNT ON CAPITAL STOCK. Premium Realized on Stock Issued During Year. (p)	PREMIUM AND DISCOUNT ON CAPITAL STOCK. Premium Released During Year. (q)	PREMIUM AND DISCOUNT ON CAPITAL STOCK. Unextinguished Discount at Beginning of Year. (r)	PREMIUM AND DISCOUNT ON CAPITAL STOCK. Discount Extinguished During the Year. (s)	PREMIUM AND DISCOUNT ON CAPITAL STOCK. Discount or Premium at Close of Year. (t)	Name of Account Credited or Debited with Premium and Discount Written off During Year. (u)
1	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	
2											
3											
4											
5											
6											
7											
8											

REMARKS.

LONG TERM DEBT—UNMATURED.

Line No.	Description of Obligation. (a)	TERM.		Par Value Authorized. (d)	Amount of Authorization Cancelled Prior to Issue. (e)	Par Value of Amount Issued. (f)	Reacquired After Issue and Cancelled. (g)	PAR VALUE OUTSTANDING.				
		Date of Issue. (b)	Date of Maturity. (c)					Not Held by or for Respondent. (h)	REACQUIRED.		HELD IN TREASURY.	
									Unpledged. (i)	Pledged. (j)	Unpledged. (k)	Pledged. (l)
1				$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
2												
3												
4												
5												
6												
7												
8												
9	Total,											

Line No.	Par Value Outstanding—Continued.		INTEREST.						DISCOUNT* AND PREMIUM ON FUNDED DEBT OUTSTANDING.				
	Held in Sinking or other Reserve Funds. (m)	Total Par Value Outstanding. (Columns h to m inclusive.) (n)	Rate. (o)	When Payable. (p)	Accrued During Year. (q)	Paid During Year. (r)	Liability at Close of Year.		Unextinguished Discount or Premium at Beginning of Year. (u)	Discount on Actual Issues Made During Year. (v)	Premium on Actual Issues Made During Year. (w)	Discount or Premium Written off During Year. (x)	Unextinguished Discount or Premium at Close of Year. (y)
							Matured Int. Unpaid. (s)	Accrued Not Due. (t)					
1	$ c.	$ c.			$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
2													
3													
4													
5													
6													
7													
8													
9													

* Include unamortized expense.

RECEIVER'S CERTIFICATES.

Line No.	DATE ISSUED. (a)	Amount Issued. (b)	Amount Outstanding. (c)	PRINCIPAL.		INTEREST.		Rate. (h)
				Amount Paid During Year. (d)	Amount Funded or Otherwise Disposed of. (e)	Amount Accrued During Year. (f)	Amount Paid During Year. (g)	
1		$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	%
2								
3								
4								
5								
6								
7	Total.							

NOTES PAYABLE.

Line No.	Date of Issue. (a)	Date of Maturity. (b)	Name of Creditor or of Obligation. (c)	Amount Outstanding at Close of Year. (d)	INTEREST. Accrued During Year. (e)	INTEREST. Paid During Year. (f)	Collateral, if Any. (g)	Is Present Note a Renewal? (h)	IF A RENEWAL. Date of Issue of Original Note. (i)	IF A RENEWAL. Amount of Original Note. (j)
1				$ c.	$ c.	$ c.				$ c.
2										
3										
4										
5										
6										
7										
8										
9			Total.							

AUTHORIZATION DATA.

The data called for below should be given concerning all securities, issued or assumed by the respondent, whether or not authorized by the Commission.

Line No.	KIND OF SECURITY. (a)	Authorized by Commission. Date. (b)	Authorized by Commission. Authorization No. (c)	Authorized by Commission. Amount. (d)	Par Value Issued to Dec. 31, 1924. (e)	Reacquired After Issue and Cancelled. (f)	Held by or for Respondent at Dec. 31, 1924. (g)	Not Held by or for Respondent at Dec. 31, 1924. (h)	Total Par Value Outstanding at Dec. 31, 1924. (i)
1	ISSUED PRIOR TO JAN. 1, 1914: Common Stock.			$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
2	Preferred Stock.								
3									
4	Funded Debt.								
5									
6									
7	ISSUED SINCE DEC. 31, 1913:								
8	Each authorization must be shown separately.								
9	Stocks:								
10									
11									
12									
13									
14									
15									
16	Bonds:								
17									
18									
19									
20									
21									
22									
23									
24									
25	Other Obligations:								
26									
27									
28									
29	Total.								

DIVIDENDS.

				DIVIDENDS DURING THE YEAR.		DATE.			DIVIDENDS AT CLOSE OF YEAR.	
Line No.	Name of Stock. (a)	Dollars Per Share (b)	Rate Per Cent (c)	Par Value of Amount on which Declared. (1) (d)	Amount of Dividend. (e)	Declared. (f)	Payable. (g)	Dividends Paid During the Year. (h)	Due and Unpaid.* (i)	Declared but Not Yet Due. (j)
				$ c.	$ c.			$ c.	$ c.	$ c.
14										
15										
16										
17										
18										
19										
20										
21	Total,									

*Includes Dividends Payable January 1.

(1) For no par stock show number of shares.

ADVANCES FROM AFFILIATED COMPANIES.

			Principal Received During Year.			Principal Repaid During Year.		Interest.		
Line No.	NAME OF CREDITOR COMPANY. (a)	Total Amount Owing at Beginning of Year. (b)	Amount. (c)	Date of Receipt. (d)	Date of Maturity. (e)	Amount. (f)	Date of Repayment. (g)	Rate per Annum. (h)	Amount Accrued During Year. (i)	Total Amount Owing at Close of Year. (j)
		$ c.	$ c.			$ c.		%	$ c.	$ c.
21	Notes Payable—Demand.									
22										
23										
24										
25	Notes Payable—Time,									
26										
27										
28	Accounts Payable,									
29										
30										
31	Total									

RETIREMENT RESERVE.

Line No.	ITEM. (a)	Electric. (b)	Gas. (c)	Heating. (d)	Water. (e)	Other Departments. (f)	Total (g)
	CREDITS:	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
1	Balance at beginning of year,						
2	Charges to operating expenses:						
3	Retirement expense (account 938),						
4	Other operating expense accounts (specify),						
5							
6							
7							
8	Charges to profit and loss,						
9	Other credits (specify),						
10							
11							
12							
13	Total Credits,						
	DEBITS:						
14	Retirement of Plant and Equipment,						
15	Other debits (specify),						
16							
17							
18							
19							
20	Total Debits,						
21	Balance at close of year,						

State hereunder the rules used by the respondent for computing the amounts credited to retirement reserve.

OTHER RESERVES.

Show the particulars called for concerning reserves carried in respondent's accounts at the close of the year.

Under contingency reserves and miscellaneous reserves, state the purpose of each reserve carried under these titles.

Line No.	Name of Account. (a)	Balance at beginning of year. (b)	Debits during year. (c)	Credits during year. (d)	Balance at close of year. (e)
		$ c.	$ c.	$ c.	$ c.
1	Casualty and Insurance Reserve.				
2					
3					
4					
5					
6					
7					
8					
9					
10					
11	Sinking Fund Reserves.				
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22	Contributions for Extensions (state class of service).				
23					
24					
25					
26					
27					
28					
29					
30					
31					
32	Contingency Reserve (state purpose).				
33					
34					
35					
36					
37					
38					
39					
40					
41					
42	Miscellaneous Reserves (state purpose).				
43					
44					
45					
46					
47					
48					
49					
50					
51					
52					

MISCELLANEOUS CURRENT LIABILITIES.

Line No.	Description. (a)	Amount. (b)
		$ c.
1		
2		
3		
4		
5		
6		
7		
8	Total	

MISCELLANEOUS ACCRUED LIABILITIES.

Line No.	Description. (a)	Amount. (b)
		$ c.
11		
12		
13		
14		
15		
16		
17	Total	

MISCELLANEOUS UNADJUSTED CREDITS.

Line No.	Description. (a)	Amount. (b)
		$ c.
21		
22		
23		
24		
25		
26		
27	Total	

INCOME ACCOUNT.

Line No.	Item. (a)	Electric. (b)	Gas. (c)	Heating. (d)	Water. (e)	Other Operations. (f)	Total. (g)
		$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
1	INCOME FROM OPERATING PROPERTIES:						
2	401. Operating Revenues,						
3	402. Operating Expenses,						
4	403. Uncollectible Bills,						
5	404. Taxes,						
6	Total Revenue Deductions,						
7	Operating Income:						
8	411. Rent for lease of other plants,						
9	412. Amortization of limited term land rights,						
10	Total (items 411 and 412),						
11	413. Rent accrued from lease of plants—Cr.,						
12	Net rent deduction (credit balance in red),						
13	Net Operating Income,						
14	INCOME FROM NON-OPERATING PROPERTIES:						
15	421. Miscellaneous Rent Revenues,						
16	422. Interest on Long Term Debt owned,						
17	423. Miscellaneous Interest Revenues,						
18	424. Dividend Revenues,						
19	425. Income from special funds,						
20	426. Miscellaneous Non-operating Revenues,						
21	Total (items 421 to 426, inclusive),						
22	427. Non-operating Revenue Deductions,						
23	Total Non-operating Income,						
24	Gross Corporate Income,						
25	DEDUCTIONS FROM GROSS CORPORATE INCOME:						
26	431. Interest on Long Term Debt,						
27	432. Miscellaneous Interest Deductions,						
28	433. Amortization of Debt Discount and Expense,						
29	434. Amortization of Premium on Debt—Cr.,						
30	435. Miscellaneous Amortization chargeable to Income,						
31	436. Miscellaneous Deductions from Gross Corporate Income,						
32	Total Deductions from Gross Corporate Income,						
33	Net Income (loss in red),						
34	DISPOSITION OF NET INCOME:						
35	441 Sinking Fund Appropriations,						
36	442. Dividend appropriations of income,						
37	443. Miscellaneous appropriations of net income,						
38	Total appropriations of Net Income,						
39	Balance Transferred to Profit and Loss,						

NOTE.—When two or more kinds of service are rendered, items on lines 2 to 13, inclusive, must be stated separately for each service. Apportionment of items below line 13 to the different kinds of service rendered is not required.

4 PROFIT AND LOSS ACCOUNT.

Line No.	Account. (a)	Debits. (b)	Credits. (c)
1	Balance at beginning of the fiscal period,	$ c.	$ c.
2	Balance Transferred from Income Account.		
3	501. Dividend Appropriations of Surplus,		
4	502. Appropriations to Reserves,		
5	503. Miscellaneous Credits to Profit and Loss,		
6	504. Miscellaneous Debits to Profit and Loss,		
7	Balance at the end of the fiscal period,		
8	Total,		

Give a detailed analysis of accounts 436—"Miscellaneous deductions from gross corporate income," and 443—"Miscellaneous appropriations of net income," in the Income Account; and accounts 502—"Appropriations to reserves," 503—"Miscellaneous credits to profit and loss," and 504—"Miscellaneous debits to profit and loss," in the Profit and Loss Account. State sub-totals for each account.

Line No.	Acct. No.	Item. (a)	Debits. (b)	Credits. (c)
10			$ c.	$ c.
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				
41				
42				
43				
44				
45				

TAXES.

A—TAXES PAID DURING YEAR.

Show the particulars called for with respect to taxes paid during the year.

Classify the different kinds of taxes paid as indicated in column (a), and show to what accounts the payments were charged. The sum of columns (c) and (e) should be equal to column (b).

This schedule should not include special assessments for local improvements, or income taxes levied on bondholders and assumed by the company under terms of mortgages.

Line No.	Kind of Tax. (a)	Amount Paid. (b)	DISTRIBUTION OF PAYMENTS.			Period to which Payments are Applicable. (f)
			Charged to Taxes Accrued or Prepaid Taxes. (c)	CHARGED TO OTHER ACCOUNTS.		
				Name or Number of Account. (d)	Amount. (e)	
1	**State, County and other local taxes:**	$ ¢	$ ¢		$ ¢	
2						
3	State franchise tax on capital stock:					
4						
5						
6	Franchise tax on earnings:					
7						
8						
9	Federal Income tax:					
10	Other Federal taxes (detail):					
11						
12						
13	Total,					

B—TAX ACCRUALS AND DISTRIBUTION OF CHARGES.

Show hereunder a summary of the debits and credits to the controlling accounts for taxes accrued and prepaid taxes, classified as indicated.

Line No.	ITEM.	AMOUNT.	ITEM.	AMOUNT.
21	Taxes paid, charged to Taxes accrued or Prepaid Taxes (See table above),	$ ¢	Tax liability, beginning of year, $______	$ ¢
22			Prepaid taxes, beginning of year, $______	
23			Balance,	
24			Tax accruals deducted from—	
25			Electric operating revenue, p. 22, l. 5, col. b.	
26	Miscellaneous Adjustments (describe fully),		Gas operating revenue, p. 22, l. 5, col. c.	
27			Heating operating revenue, p. 22, l. 5, col. d.	
28			Water operating revenue, p. 22, l. 5, col. e.	
29			Electric Railroad operating revenue, Form 2.	
30			Income from non-utility business.	
31			Income from Miscellaneous Investments.	
32				
33				
34			Miscellaneous Adjustments (describe fully):	
35	Tax liability, close of year, $______			
36	Prepaid Taxes, close of year, $______			
37	Balance,			
38	Total,		Total.	

C—EXPLANATIONS.

State here the particulars of—

(a) All Taxes (including special assessments) charged to Fixed Capital during the year.

(b) Apportionment of Tax payments not charged to Taxes Accrued or Prepaid Taxes.

(c) The basis upon which taxes are apportioned to electric, gas, and other operations.

PLANT AND EQUIPMENT
OPERATING REVENUES
OPERATING EXPENSES
STATISTICS AND PHYSICAL CHARACTERISTICS

FIXED CAPITAL CHANGES DURING YEAR—ELECTRIC.

Give particulars called for with respect to changes during the year in the accounts of the respondent representing fixed capital devoted **exclusively** to electric utility operations.

Additions and retirements relating to fixed capital devoted in common to two or more kinds of utility operations (electric and gas, etc.) should not be included in this schedule but in the schedule "Fixed Capital—general," on page 9, provided such additions and retirements are not apportioned to the utility departments interested.

If the fixed capital of the respondent has been reclassified during the year in accordance with the Uniform Classification of Accounts for Electric Utilities, effective Jan. 1, 1923, entries giving effect to such reclassification should be made in column (d); attention should be called in a footnote to the fact that such reclassification has been made.

Line No.	Account. (a)	Additions during year. (b)	Retirements during year. (c)	Adjustments during year. (d)	Net Change during year. (e)
		$ c.	$ c.	$ c.	$ c.
1	301. Organization,				
2	302. Franchises,				
3	303. Miscellaneous Intangible Capital,				
4	311. Land,				
5	(a) Steam Power Plant Land,				
6	(b) Hydro-electric Power Plant Land,				
7	(c) Gas Power Plant Land,				
8	(d) Transmission System Land,				
9	(e) Distribution System Land,				
10	(f) General Office Land,				
11	(g) Miscellaneous Land Devoted to Electric Operations,				
12	(g-1) Stores Department Land,				
13	(g-2) General Shops Land,				
14	(g-3) Transportation Department Land,				
15	(g-4) Communication System Land,				
16	(g-5) Miscellaneous Land,				
17	312. Structures,				
18	(a) Steam Power Plant Structures,				
19	(b) Hydro-electric Power Plant Structures,				
20	(c) Gas Power Plant Structures,				
21	(d) Transmission System Structures,				
22	(e) Distribution System Structures,				
23	(f) General Office Structures,				
24	(g) Miscellaneous Structures Devoted to Electric Operations,				
25	(g-1) Stores Department Structures,				
26	(g-2) General Shop Structures,				
27	(g-3) Transportation Department Buildings,				
28	(g-4) Communication System Buildings,				
29	(g-5) Miscellaneous Buildings,				
30	313. Boiler Plant Equipment,				
31	314. Prime Movers and Auxiliaries—Steam,				
32	315. Turbo-Generator Units—Steam,				
33	316. Electric Plant—Steam,				
34	317. Miscellaneous Power Plant Equipment—Steam,				
35	318. Reservoirs, Dams, and Waterways,				
36	319. Roads, Trails and Bridges,				
37	320. Water Turbines and Water-wheels,				

38	321. Turbo-Generator Units—Hydro,
39	322. Electric Plant—Hydro,
40	323. Miscellaneous Power Plant Equipment—Hydro,
41	324. Fuel Holders, Transmitters and Accessories,
42	325. Internal Combustion Engines,
43	326. Electric Plant—Gas,
44	327. Miscellaneous Power Plant Equipment—Gas,
45	328. Substation Equipment,
46	329. Storage Battery Equipment,
47	330. Underground Conduits,
48	331. Poles, Towers, and Fixtures,
49	332. Overhead Conductors and Devices,
50	333. Underground Conductors,
51	334. Transmission Roads and Trails,
52	335. Services,
53	336. Line Transformers and Devices,
54	337. Line Transformer Installation,
55	338. Consumers' Meters,
56	339. Meter Installation,
57	340. Installation on Consumers' Premises,
58	341. Commercial Lamps,
59	342. Street Lighting Equipment,
60	343. Electric Appliances,
61	344. General Equipment,
62	(a) Office Equipment,
63	(b) Shop Equipment,
64	(c) Stores Equipment,
65	(d) Transportation Equipment,
66	(e) Telephone, Telegraph, and Wireless System,
67	(f) Laboratory Equipment,
68	(g) Miscellaneous Equipment,
69	345. Miscellaneous Tangible Capital,
70	351. Engineering and Superintendence,
71	352. Law Expenditures During Construction,
72	353. Injuries and Damages During Construction,
73	354. Taxes During Construction,
74	355. Interest During Construction,
75	356. Miscellaneous Construction Expenditures,
76	358. Cost of Plant and Equipment Purchased,
77	359. Unfinished Construction,
78	Total,

NOTE: Account 357, "Fixed Capital Not Classified by Prescribed Accounts," is not included above for the reason that the schedule is intended to cover only changes in fixed capital during the current year Provision has been made on page 8 for showing total fixed capital at beginning of year whether or not classified in accordance with the prescribed accounts. If Fixed Capital installed prior to Jan. 1, 1923, has been reclassified during the year, see instructions at the top of the foregoing schedule.

OPERATING REVENUES.

Line No.	ACCOUNT. (a)		Number of Kilowatt Hours. (c)	Amount. (d)
1	Sales of Current:			$ c.
2	601. Metered sales to general consumers,			
3	(a) Residence lighting,			
4	(b) Commercial lighting,			
5	(c) Commercial power,			
6	(d) Combination light and power,			
7	(e) Other sales—metered,			
8	602. Flat-rate sales to general consumers,			
9	(a) Residence lighting,			
10	(b) Commercial lighting,			
11	(c) Commercial power,			
12	603. Railroad corporations,			
13	604. Other electrical corporations,			
14	605. Municipal street lighting,			
15	606. Miscellaneous municipal sales,			
16	Total Sales of Current,			
17	Miscellaneous Revenue:	Gross Revenues. (b)	Expenses. (c)	
18	611. Commissions on others' electric energy,	$ c.	$ c.	
19	612. Rent from electric appliances,			
20	613. Rent from property used in operation,			
21	614. Merchandise and jobbing,			
22	615. Miscellaneous operating revenues,			
23	Total Miscellaneous Revenue,			
24	Total Operating Revenue (line 2, page 22),			

SALES TO RAILROAD CORPORATIONS.

Line No.	Name of Purchasing Company. (a)	Number of Kilowatt Hours. (b)	Amount of Revenue. (c)
31			$ c.
32			
33			
34			
35			
36	Total (Account No. 603),		

SALES TO OTHER ELECTRICAL CORPORATIONS.

Line No.	Name of Purchasing Company. (a)	Number of Kilowatt Hours. (b)	Amount of Revenue. (c)
41			$ c.
42			
43			
44			
45			
46			
47	Total (Account No. 604),		

✓

OPERATING EXPENSES—CLASS A COMPANIES.

For companies having annual revenues from electric operations exceeding $250,000.

Line No.	ACCOUNT. (a)	Item. (b)	Amount. (c)
1	Steam Power Generation:	$	$
2	702. Superintendence,		
3	703. Boiler Labor,		
4	704. Engine Labor,		
5	705. Electrical Labor,		
6	706. Miscellaneous Labor,		
7	708. Fuel,		
8	709. Water,		
9	711. Lubricants,		
10	712. Production Supplies,		
11	713. Station Expenses,		
12	715. Maintenance of Station Buildings,		
13	717. Maintenance of Furnaces and Boilers,		
14	718. Maintenance of Boiler Apparatus,		
15	719. Maintenance of Steam Accessories,		
16	720. Maintenance of Steam Engines,		
17	721. Maintenance of Turbo-Generator Units,		
18	723. Maintenance of Main Generators,		
19	724. Maintenance of Exciting Apparatus,		
20	725. Maintenance of Control and Protective Equipment,		
21	726. Maintenance of Transformers and Converting Apparatus,		
22	727. Maintenance of Miscellaneous Power Plant Equipment,		
23	728. Steam Generated—Apportionment Account,		
24	729. Steam from other sources,		
25	Total Steam Power Generation, √	→	
26	Hydro-Electric Generation:		
27	732. Superintendence,		
28	733. Hydro-Electrical Labor,		
29	734. Station Labor,		
30	735. Miscellaneous Labor,		
31	737. Water for Power,		
32	739. Lubricants,		
33	740. Production Supplies,		
34	741. Station Expense,		
35	743. Maintenance of Station Buildings,		
36	745. Maintenance of Reservoirs, Dams and Intakes,		
37	746. Maintenance of Navigation Facilities,		
38	747. Maintenance of Waterways,		
39	748. Maintenance of Forebays, Penstocks and Tail-races,		
40	749. Maintenance of Way and Cars,		
41	750. Maintenance of Telephone System,		
42	751. Maintenance of Production Roads and Trails,		
43	753. Maintenance of Water Turbines and Water Wheels,		
44	754. Maintenance of Turbo-Generator Units,		
45	755. Maintenance of Main Generators,		
46	756. Maintenance of Exciting Apparatus,		
47	757. Maintenance of Control and Protective Equipment,		
48	758. Maintenance of Transformers and Converting Apparatus,		
49	759. Maintenance of Miscellaneous Power Plant Equipment,		
50	Total Hydro-Electric Generation,	→	

OPERATING EXPENSES—CLASS A COMPANIES—Continued.

Line No.	ACCOUNT. (a)	Item. (b)	Amount. (c)
1	Gas Power Generation:	$ c.	$ c.
2	762. Superintendence,		
3	763. Fuel Labor,		
4	764. Engine Labor,		
5	765. Electrical Labor,		
6	766. Miscellaneous Labor,		
7	768. Engine Fuel,		
8	770. Water,		
9	771. Lubricants,		
10	772. Production Supplies,		
11	773. Station Expense,		
12	775. Maintenance of Station Buildings,		
13	777. Maintenance of Fuel Holders, Producers and Accessories,		
14	778. Maintenance of Engines and Turbines,		
15	780. Maintenance of Main Generators,		
16	781. Maintenance of Exciting Apparatus,		
17	782. Maintenance of Control and Protective Apparatus,		
18	783. Maintenance of Transformers and Converting Apparatus,		
19	784. Maintenance of Miscellaneous Power Plant Equipment,		
20	785. Power Gas from other sources,		
21	Total Gas Power Generation,	→	
22	Miscellaneous Production Accounts:		
23	791. Electric Energy from other sources,	→	
24	792. Duplicate Production Charges—Cr.,	→	
25	793. Production Expenses Transferred—Cr.,	→	
26	Total Production Expenses,	→	
27	Transmission Expenses:		
28	802. Superintendence,		
29	803. Sub-Station Labor,		
30	804. Sub-Station Supplies and Expenses,		
31	806. Labor and Expense—Underground Conduits,		
32	807. Labor and Expense—Poles, Towers, and Fixtures,		
33	808. Labor and Expense—Overhead Conductors,		
34	809. Labor and Expense—Underground Conductors,		
35	810. Miscellaneous Supplies and Expenses,		
36	811. Maintenance of Structures,		
37	812. Maintenance of Sub-station Equipment,		
38	813. Maintenance of Underground Conduits,		
39	815. Maintenance of Poles, Towers, and Fixtures,		
40	816. Maintenance of Overhead Conductors,		
41	817. Maintenance of Underground Conductors,		
42	818. Maintenance of Roads and Trails,		
43	Total Transmission Expenses,	→	

✓

OPERATING EXPENSES—CLASS A COMPANIES—Continued.

Line No.	ACCOUNT. (a)	Item. (b)	Amount (c)
		$ c.	$ c.
1	Distribution Expenses:		
2	822. Superintendence,		
3	824. Sub-station Labor,		
4	825. Sub-station Supplies and Expenses,		
5	827. Storage Battery Labor,		
6	828. Storage Battery Supplies and Expenses,		
7	830. Labor and Expense—Underground Conduits,		
8	831. Labor and Expense—Poles, Towers, and Fixtures,		
9	832. Labor and Expense—Overhead Conductors,		
10	833. Labor and Expense—Underground Conductors,		
11	834. Miscellaneous Supplies and Expenses,		
12	836. Salaries and Expenses—Meter Department,		
13	837. Testing Meters,		
14	838. Miscellaneous Expenses—Meter Department,		
15	839. Removing and Resetting Meters,		
16	840. Removing and Resetting Transformers,		
17	841. Maintenance of Structures.		
18	842. Maintenance of Sub-station Equipment,		
19	843. Maintenance of Storage Battery Equipment,		
20	844. Maintenance of Underground Conduits,		
21	846. Maintenance of Poles, Towers, and Fixtures,		
22	847. Maintenance of Overhead Conductors,		
23	848. Maintenance of Underground Conductors,		
24	849. Maintenance of Services,		
25	851. Maintenance of Line Transformers,		
26	852. Maintenance of Consumers' Meters,	→	
27	Total Distribution Expenses,		
28	Utilization:		
29	863. Commercial Arc Lamps,		
30	864. Incandescent Lamps—Installation,		
31	865. Incandescent Lamps—Renewals,		
32	867. Inspection—Consumers' Premises,		
33	868. Consumers' Installations,		
34	870. Municipal Street Arc Lamps,		
35	871. Municipal Street Incandescent Installations,		
36	872. Municipal Street Incandescent Renewals,		
37	873. Maintenance of Commercial Lamps,		
38	875. Maintenance of Municipal Street Arc Lamps,		
39	876. Maintenance of Municipal Street Incandescent Lamps,	→	
40	Total Utilization Expense, ✓		
41	Commercial Expenses:		
42	882. Commercial General Labor,		
43	884. Commercial Bookkeeping,		
44	885. Commercial Contracts,		
45	887. Commercial Collecting.		
46	888. Meter Reading,		
47	889. Commercial Supplies and Expenses,		
48	890. Agents' Commissions,	→	
49	Total Commercial Expenses,		

OPERATING EXPENSES—CLASS A COMPANIES—Concluded.

Line No.	ACCOUNT. (a)	Item. (b)	Amount. (c)
1	New Business Expenses:	$ c.	$ c.
2	903. New Business Management Salaries,		
3	904. New Business Advertising Salaries,		
4	906. Demonstrations,		
5	907. Wiring and Appliances,		
6	908. Advertising Supplies and Expenses,		
7	909. Canvassing and Soliciting,		
8	910. Miscellaneous New Business Supplies and Expenses,		
9	Total New Business Expense,	• • • • →	
10	General and Miscellaneous Expenses:		
11	923. Administrative Salaries,		
12	924. Other General Office Salaries,		
13	926. General Office Supplies and Expenses,		
14	927. General Stationery and Printing,		
15	928. Maintenance of General Structures,		
16	929. Operation of Communication System,		
17	930. Maintenance of Communication System,		
18	931. Law Expenses,		
19	932. Insurance,		
20	933. Store Expenses,		
21	934. Transportation Expenses,		
22	935. Undistributed Adjustments,		
23	936. Rentals,		
24	937. Other Miscellaneous General Expenses,		
25	938. Retirement Expense,		
26	940. Claim Department Expenses,		
27	941. Medical Expenses,		
28	942. Injuries to Employees,		
29	943. Other Personal Injuries and Property Damage,		
30	944. Miscellaneous Accident Expenses,		
31	945. Regulatory Commission Expenses,		
32	947. Employees' Welfare Department,		
33	948. Pensions,		
34	949. Franchise Requirements,		
35	950. Amortization of Franchises,		
36	951. Electric Expenses Transferred—Cr.,		
37	952. Joint Operating Expenses—Cr.,		
38	953. Duplicate Miscellaneous Charges—Cr.,		
39	Total General and Miscellaneous Expenses,	• • • • →	

OPERATING EXPENSES—CLASS B COMPANIES.

For companies having annual revenues from electric operations of more than $50,000 but not exceeding $250,000.

Line No.	ACCOUNT. (a)	Item. (b)	Amount. (c)
		$ c.	$ c.
1	Steam Power Generation:		
2	701. Superintendence and Labor,		
3	708. Fuel,		
4	709. Water,		
5	710. Miscellaneous Supplies and Expenses,		
6	715. Maintenance of Station Buildings,		
7	716. Maintenance of Steam Equipment,		
8	722. Maintenance of Electrical Equipment,		
9	727. Maintenance of Miscellaneous Power Plant Equipment,		
10	728. Steam Generated—Apportionment Account,		
11	729. Steam from Other Sources,		
12	Total Steam Power Generation,	→	
13	Hydro-Electric Generation:		
14	731. Superintendence and Labor,		
15	737. Water for Power,		
16	738. Miscellaneous Supplies and Expenses,		
17	743. Maintenance of Station Buildings,		
18	744. Maintenance of Reservoirs, Dams and Waterways,		
19	752. Maintenance of Hydro-Electric Equipment,		
20	759. Maintenance of Miscellaneous Power Plant Equipment,		
21	Total Hydro-Electric Generation,	→	
22	Gas Power Generation:		
23	761. Superintendence and Labor,		
24	768. Engine Fuel,		
25	769. Miscellaneous Supplies and Expenses,		
26	775. Maintenance of Station Buildings,		
27	776. Maintenance of Gas Equipment,		
28	779. Maintenance of Electric Equipment,		
29	784. Maintenance of Miscellaneous Power Plant Equipment,		
30	785. Power Gas from Other Sources,		
31	Total Gas Power Generation,	→	
32	Miscellaneous Production Accounts:		
33	791. Electric Energy from Other Sources,	→	
34	792. Duplicate Production Charges—Cr.,	→	
35	793. Production Expenses Transferred—Cr.,	→	
36	Total Production Expenses,	→	
37	Transmission Expenses:		
38	802. Superintendence,		
39	803. Sub-station Labor,		
40	804. Sub-station Supplies and Expenses,		
41	805. Operation of Transmission Lines,		
42	811. Maintenance of Structures,		
43	812. Maintenance of Sub-station Equipment,		
44	813. Maintenance of Underground Conduits,		
45	814. Maintenance of Transmission Lines,		
46	818. Maintenance of Roads and Trails,		
47	Total Transmission Expenses,	→	

OPERATING EXPENSES—CLASS B COMPANIES—Concluded.

Line No.	ACCOUNT. (a)	Item. (b)	Amount. (c)
1	Distribution Expenses:	$ c.	$ c.
2	822. Superintendence,		
3	823. Sub-station Expenses,		
4	826. Storage Battery Expenses,		
5	829. Operation of Distribution Lines,		
6	835. Meter and Transformer Operation,		
7	841. Maintenance of Structures,		
8	842. Maintenance of Sub-station Equipment,		
9	843. Maintenance of Storage Battery Equipment,		
10	844. Maintenance of Underground Conduits,		
11	845. Maintenance of Distribution Lines,		
12	849. Maintenance of Services,		
13	850. Maintenance of Transformers and Meters,		
14	Total Distribution Expenses,	→	
15	Utilization:		
16	862. Commercial Lamps—Operation,		
17	866. Consumers' Installation and Inspection Work,		
18	869. Municipal Street Lamps—Operation,		
19	873. Maintenance of Commercial Lamps,		
20	874. Maintenance of Municipal Street Lighting Equipment,		
21	Total Utilization Expenses,	→	
22	Commercial Expenses:		
23	882. Commercial General Labor,		
24	883. Commercial Books and Contracts,		
25	886. Commercial Meter Reading and Collecting,		
26	889. Commercial Supplies and Expenses,		
27	890. Agents' Commissions,		
28	Total Commercial Expenses,	→	
29	New Business Expenses:		
30	902. New Business Salaries,		
31	905. New Business Supplies and Expenses,		
32	Total New Business Expenses,	→	
33	General and Miscellaneous Expenses:		
34	922. General Office Salaries,		
35	926. General Office Supplies and Expenses,		
36	927. General Stationery and Printing,		
37	928. Maintenance of General Structures,		
38	929. Operation of Communication System,		
39	930. Maintenance of Communication System,		
40	931. Law Expenses,		
41	932. Insurance,		
42	933. Store Expenses,		
43	934. Transportation Expenses,		
44	935. Undistributed Adjustments,		
45	936. Rentals,		
46	937. Other Miscellaneous General Expense,		
47	938. Retirement Expense,		
48	939. Injuries and Damages,		
49	945. Regulatory Commission Expenses,		
50	946. Relief and Welfare Work,		
51	949. Franchise Requirements,		
52	950. Amortization of Franchise,		
53	951. Electric Expenses Transferred—Cr.,		
54	952. Joint Operating Expenses—Cr.,		
55	953. Duplicate Miscellaneous Charges—Cr.,		
56	Total General and Miscellaneous Expenses,	→	

OPERATING EXPENSES—CLASS C COMPANIES.

For companies having annual revenues from electric operations less than $50,000.

Line No.	ACCOUNT. (a)	Item. (b)	Amount. (c)
		$ c.	$ c.
1	Steam Power Generation:		
2	701. Superintendence and Labor,		
3	708. Fuel,		
4	709. Water,		
5	710. Miscellaneous Supplies and Expenses,		
6	715. Maintenance of Station Buildings,		
7	716. Maintenance of Steam Equipment,		
8	722. Maintenance of Electrical Equipment,		
9	727. Maintenance of Miscellaneous Power Plant Equipment,		
10	728. Steam Generated—Apportionment Account,		
11	729. Steam from Other Sources,		
12	Total Steam Power Generation,	→	
13	Hydro-Electric Generation:		
14	731. Superintendence and Labor,		
15	737. Water for Power,		
16	738. Miscellaneous Supplies and Expenses,		
17	743. Maintenance of Station Buildings,		
18	744 Maintenance of Reservoirs, Dams and Waterways,		
19	752. Maintenance of Hydro-Electric Equipment,		
20	759. Maintenance of Miscellaneous Power Plant Equipment,		
21	Total Hydro-Electric Generation,	→	
22	Gas Power Generation:		
23	761. Superintendence and Labor,		
24	768. Engine Fuel,		
25	769. Miscellaneous Supplies and Expenses,		
26	775. Maintenance of Station Buildings,		
27	776. Maintenance of Gas Equipment,		
28	779. Maintenance of Electric Equipment,		
29	784. Maintenance of Miscellaneous Power Plant Equipment,		
30	785. Power Gas from Other Sources,		
31	Total Gas Power Generation,	→	
32	Miscellaneous Production Accounts:		
33	791. Electric Energy from Other Sources,	→	
34	792. Duplicate Production Charges—Cr.,	→	
35	793. Production Expenses Transferred—Cr.,	→	
36	Total Production Expenses,	→	
37	Transmission Expenses:		
38	802. Superintendence,		
39	803. Sub-station Labor,		
40	804. Sub-station Supplies and Expenses,		
41	805. Operation of Transmission Lines,		
42	811. Maintenance of Structures,		
43	812. Maintenance of Sub-station Equipment,		
44	813. Maintenance of Underground Conduits,		
45	814. Maintenance of Transmission Lines,		
46	818. Maintenance of Roads and Trails,		
47	Total Transmission Expenses,	→	

OPERATING EXPENSES—CLASS C COMPANIES—Concluded.

Line No.	ACCOUNT. (a)	Item. (b)	Amount. (c)
1	Distribution Expenses:	$ c.	$ c.
2	822. Superintendence,		
3	823. Sub-station Expense,		
4	826. Storage Battery Expenses,		
5	829. Operation of Distribution Lines,		
6	835. Meter and Transformer Operation,		
7	841. Maintenance of Structures,		
8	842. Maintenance of Sub-station Equipment,		
9	843. Maintenance of Storage Battery Equipment,		
10	844. Maintenance of Underground Conduits,		
11	845. Maintenance of Distribution Lines,		
12	849. Maintenance of Services,		
13	850. Maintenance of Transformers and Meters,		
14	Total Distribution Expenses,	→	
15	Utilization:		
16	862. Commercial Lamps—Operation,		
17	866. Consumers' Installation and Inspection Work,		
18	869. Municipal Street Lamps—Operation,		
19	873. Maintenance of Commercial Lamps,		
20	874. Maintenance of Municipal Street Lighting Equipment,		
21	Total Utilization,	→	
22	Commercial Expenses:		
23	881. Commercial Administration,		
24	890. Agents' Commissions,		
25	Total Commercial Expenses,	→	
26	New Business Expenses:		
27	901. New Business Expenses,		
28	Total New Business Expenses,	→	
29	General and Miscellaneous Expenses:		
30	922. General Office Salaries,		
31	925. Miscellaneous General Expenses,		
32	938. Retirement Expense,		
33	939. Injuries and Damages,		
34	945. Regulatory Commission Expenses,		
35	946. Relief and Welfare Work,		
36	949. Franchise Requirements,		
37	950. Amortization of Franchises,		
38	951. Electric Expenses Transferred—Cr.,		
39	952. Joint Operating Expenses—Cr.,		
40	953. Duplicate Miscellaneous Charges—Cr.,		
41	Total General and Miscellaneous Expenses,	→	

SUMMARY OF OPERATING EXPENSES.

Line No.	ACCOUNT. (a)	Amount. (b) $ c.
1	Total Production Expenses,	
2	Total Transmission Expenses,	
3	Total Distribution Expenses,	
4	Total Utilization Expenses,	
5	Total Commercial Expenses,	
6	Total New Business Expenses,	
7	Total General and Miscellaneous Expenses,	
8	Total Operating Expenses—Electric (to l. 3, p. 22),	

STEAM GENERATED—APPORTIONMENT ACCOUNT.

(For Combined Utilities only.)

The table following will not be completed except in cases where other utility services or enterprises are operated by respondent in connection with the electric utility, and steam for such operations is supplied from a common boiler plant. In such cases the entire cost of steam generation and the apportionment of such cost should be shown in the following table. The basis of apportionment should be fully explained in a footnote.

A—COST OF STEAM GENERATED.

Line No.	Name of Account. (a)	Amount (b) $ c.
21	703. Boiler Labor,	
22	706. Miscellaneous Labor,	
23	708. Fuel,	
24	709. Water,	
25	711. Lubricants,	
26	712. Production Supplies,	
27	713. Station Expense,	
28	715. Maintenance of Station Buildings,	
29	717. Maintenance of Furnaces and Boilers,	
30	718. Maintenance of Boiler Apparatus,	
31	719. Maintenance of Steam Accessories,	
32	727. Maintenance of Miscellaneous Power Plant Equipment,	
33	729. Steam from other sources,	
34	Total Cost of Steam Generated,	

B—APPORTIONMENT OF COST.

Line No	Acct. No.	Apportioned to Electric Utility. (c)	Apportioned to Gas Utility. (d)	Apportioned to Heating Utility. (e)	Apportioned to ________ (f)	Apportioned to ________ (g)
21	703					
22	706					
23	708					
24	709					
25	711					
26	712					
27	713					
28	715					
29	717					
30	718					
31	719					
32	727					
33	729					
33	Total,					

State the basis on which the apportionment was made.

IMPORTANT PHYSICAL CHANGES DURING THE YEAR.

Here present statements as follows: Every item must be answered If there has been no change, that fact should be stated.

1. Important power plant equipment installed.

2. Important power plant equipment retired.

3. Other important improvements.

4. All other important physical changes.

COAL AND OIL CONSUMED DURING YEAR.

Show in the table below the quantity of coal and oil consumed in steam production during each month of the year, and the average cost per ton or gallon at which the quantity consumed was included in operating expenses.

When a boiler plant generates steam for use in other operations as well as electric include in this table the total quantity of fuel used.

Line No.	MONTH.	STEAM COAL.		FUEL OIL.	
		Tons.	Average cost per ton.	Gallons.	Average cost per gal.*
			$ c.		$ c.
10	January,				
11	February,				
12	March,				
13	April,				
14	May,				
15	June,				
16	July,				
17	August,				
18	September,				
19	October,				
20	November,				
21	December,				
22	Total and average for year,				

* Compute to two decimal places.

METERS.

On line 1 state capacity of meters, using separate column for each capacity.

FOR ALTERNATING CURRENT.

Line No.																	Total.
1	Capacity in Amperes,																
2	Number of Phases,																
3	Owned at Beginning of Year,																
4	Bought During Year,																
5	Total,																
6	Condemned and Destroyed,																
7	Owned Close of Year,																

FOR DIRECT CURRENT.

Line No.																	
11	Owned Beginning of Year,																
12	Bought During Year,																
13	Total,																
14	Condemned or Destroyed,																
15	Owned Close of Year,																

SUMMARY OF ALL METERS.

Line No.																		
21	In Use	Alternating Current,																
22		Direct Current,																
23		Company Use Alternating Current																
24		Company Use Direct Current,																
25																		
26		Total in Use,																
27	In Stock	Alternating,																
28		Direct,																
29		Total,																
30		Total Owned,																
31		Meters in Use Last Year,																
32		Increase or Decrease Meters in Use,																

DISTRIBUTION TRANSFORMERS.

On line 41 state capacity of transformers, using separate column for each capacity.

Line No.																	Total,
41	Capacity in Kilowatts,																
42	Owned Beginning of Year,																
43	Bought During Year,																
44	Total,																
45	Condemned During Year,																
46	Owned Close of Year,																
47	In Service,																
48	In Service Company Use,																
49	Total in Service,																
50	In Stock Close of Year,																
51	Total Owned,																
52	Owned Last Year,																
53	Increase or Decrease,																

PRODUCTION STATISTICS.
ENERGY FROM ALL SOURCES.

Show all data for this table separately by Stations.

Line No.	GENERATING STATION AND LOCATION. (a)	Connected Stations. (b)	Source of Power. (Steam, Water Purchased, etc.) (c)	Kind of Current. (A. C. or D. C.) (d)	Number of Kilowatt Hours Produced or Purchased. (e)	Maximum Load in Kilowatts. (f)	Maximum Capacity in Kilowatts. (g)	How is Production Measured? (h)
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14	Purchased Energy							
15	(State Point of Delivery)							
16								
17								
18								
19	Total,							
20	What is coincident maximum of all stations in kilowatts?							
21	In column (b) indicate which stations are connected by transmission line by letters, thus: "A" all stations on one system, and "B" all stations on another system, etc. In column (a) for purchased power show capacity of transformers.							

STEAM POWER STATIONS—FUEL DATA.

Line No.	Generating station and Location. (a)	Kind of Coal Used. (Screenings, Mine Run, Slack, etc.) (b)	General Location of Mine. (c)	Has Plant R. R. Siding or is Coal Hauled? (d)	Average Cost of Coal Per Ton (2,000 lbs.) Delivered at Plant. (e)	Tons of Coal Consumed During Year. (f)	Pounds per Kw-hr. Generated. (g)
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							

ELECTRIC ENERGY PURCHASED.

Line No.	Point of Delivery. (a)	From Whom Purchased. (b)	Net Cost Per kw.hr. Purchased. (c)	State Voltage and Frequency at Which Received. (d)	Is Contract on File With the Commission? (e)
33					
34					
35					
26					

HYDRAULIC POWER.

Line No.		
1	From what river is power secured?	
2	Average net head of water,	How is generation measured?
3	**GAS OR OIL POWER.**	
4	Kind of fuel used,	Quantity used,
5	Average cost of fuel per unit (ton, gallon or M. cu. ft.),	How is generation measured?
6		

Line No.			
7	MONTHLY RECORD OF OUTPUT IN KILOWATT HOURS—ALL STATIONS: (Produced and Purchased.)		
8	January	May	September
9	February	June	October
10	March	July	November
11	April	August	December
12	Total for Year,		

CLASSIFICATION OF CONSUMERS.

Classify Consumers at the close of the year as indicated in the schedule below, and show other particulars called for; quantities shown in column (c) should be consistent with those shown on page E 4, col. (c). This schedule should not include energy used by the respondent, or energy supplied without direct charge under franchise requirements, or energy used by the respondent's own railway department.

Under municipal consumers, consider each municipality served with street lighting as representing a consumer.

Line No	CLASS. (a)	Number of Consumers.*		Number of Meters in Service. (d)	Kilowatt Hours Consumed During Year. (e)
		Metered. (b)	Flat Rate. (c)		
21	Residential.				
22	Commercial,				
23	Power.				
24	Combination Light and Power,				
25	Other Public Utilities,				
26	Municipal,				
27					
28	Total,				

* State the basis of numbers shown, indicating whether based on number of accounts, meters in service, or other basis.

ENERGY PRODUCED AND DISTRIBUTED.

Show the particulars called for concerning the quantity of energy available for distribution during the year and the disposition thereof.

Line No.	ITEM. (a)	Kilowatt Hours. (b)
31	Generated (less energy used in station auxiliaries),	
32	Purchased (quantity for which respondent is billed),	
33	Exchanged (received by respondent),	
34		
35	Total available,	
36	Sold,	
37	Exchanged (delivered by respondent),	
38	Supplied without direct charge (franchise requirements, etc.),	
39	Used by respondent—Railway department,	
40	—Other departments,	
41		
42	Total distributed,	
43	Lost and unaccounted for,	

TERRITORY SERVED.

No. Line	CITY OR TOWN.	STREET LIGHTING DATA.				NO. OF CONSUMERS.			Total Kilowatt Hours Sold.	Population (estimated).	Number of Hours Per Day Service i urnished.
		ARCS.		INCANDESCENTS.							
		Number of Arcs.	Connected Load in kw.	No. of Lamps.	Connected Load in kw.	Lighting.	Power.	Total.			
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
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25											
26											
27											
28											
29											
30											
31											
32											
33											
34											
35											
36											
37	Rural Consumers.										
38	Other Utility Companies.										
39											
40											
41											
42											
43	Total,										

Note:—The total number of consumers shown in columns (f), (g), and (h) should be consistent with number shown on page E-17 under Classification of Consumers.

RECORD OF STATION EQUIPMENT.

Line No.	List below all equipment of the kind designated, giving complete data,
1	Steam Boiler Equipment (number of boilers, manufacturer. rating, type),
2	
3	
4	
5	
6	
7	
8	Source of Boiler Feed Water,
9	Steam Engine Equipment (number of units, kind, manufacturer, rating, speed, number and size of cylinders),
10	
11	
12	
13	
14	
15	
16	Do you operate Condensing or Non-Condensing? Source of Water,
17	
18	
19	
20	Hydraulic Equipment (number of units, kind, manufacturer, rating, speed, size),
21	
22	
23	
24	Gas Equipment (number of units, kind, manufacturer, rating, speed, number and size of cylinders),
25	
26	
27	Electrical Generating Equipment (number of units, kind, manufacturer, rating, speed, volting, phases, frequency, and state if direct connected),
28	
29	
30	
31	
32	
33	
34	
35	Station Electrical Conversion (number of units, kind, manufacturer, rating, speed, voltage, phases, frequency, and location),
36	
37	
38	
39	Storage Battery Equipment (number of units, kind, manufacturer, rating),
40	
41	Do you use feeder regulators? Automatic? Manual?
42	Do you use generator voltage regulators?

APPENDIX C.

REFERENCE TO ACCOUNTING LITERATURE
on
PUBLIC ACCOUNTING

APPENDIX C

REFERENCE TO ACCOUNTING LITERATURE

ON

PUBLIC UTILITIES

For those who want to familiarize themselves with some of the literature on public utilities relating to accounting, a selected list of books and periodicals are given in the following:

BOOKS

1. Public Utility Rates ....Barker, Harry
2. Public Utility Regulation.......................Cooke, M.L.
3. The Financial Plan of the New Public Utility, Vol. II, Chapter 5; The Public Utility Holding Company, Vol. IV, Chapter 5; Vol. V, pp.61-87 (In his Financial Policy of Corporations)..................................Dewing, Arthur S.
4. Valuation of Public Utility Properties........Floy, H.
5. Value for Rate Making.........................Floy, H.
6. Engineering Valuation of Public Utilities.....Foster
7. Valuation, Depreciation and the Rate Base.....Grunsby, C.E.& C.E.
8. Fair Value....................................Hartman, H.H.
9. Public Utilities-Their Fair Present Value and Return.....................................Hayes, R.V.
10. Public Utilities-Their Cost New and Depreciation..................................Hayes, R.V.
11. The Financing of Public Service Corporations..Ignatius, M.B.
12. Rate Making for Public Utilities..............Lyndon, Lamar
13. The Development of Scientific Rates for Electricity Supply, 1915. (Reprints of Selected Original Rate Papers)...............Lyndon, Lamar
14. Theory and Practice of Public Utility Valuation.....................................Maltbie, W.H.
15. Regulation and the Management of Public Utilities.....................................Morgan, C.S.
16. Depreciation of Public Utility Properties.....Riggs, Henry E.
17. Depreciation-Principles and Application, P.P. 319-445................................Saliers, E.A.
18. Accountants' Handbook, PP. 1182-1206..........Saliers, E.A.
19. Guiding Principles of Public Service Regulation....................................Spuir
20. Valuation of Public Service Corporations, Fair Value for Rate Purposes.................Whitten

PAMPHLETS, PAPERS, AND PERIODICALS

1. Accounting Treatment of Overhead Construction Costs in Public Utilities....................Anderson & Co.,
2. Allowance for Working Capital in Rate Case (Political Science Quarterly, Sept. 1916, pp 413-29)...............................Bauer, J.

3. Idea of Capitalization as Applied to Public Service Corporations (Journal of Accountancy, July 1916, pp. 1-9; Political Science Quarterly, Vol. 22, 1916)..........................Bauer, J.
4. The Economic Capitalization of a Public Utility Company, (The Annalist, June 11, '23)..Cherry, C. F.
5. Economic Conditions Affecting Public Utilities, (Gas Record, Vol. XVIII........................Hagerat, W.J.
6. Valuation of Public Utilities for Rate Making Purposes (Journal of Accountancy, Feb. '16, pp, 146-9)................................James,Chas.G.
7. Standard Accounting for Municipally Owned Public Utilities (Journal of Electricity, Jan. 1, 1922, pp. 1304.............................Edgerton,E.O.
8. Public-Utility Accounting (Area. Mar. '23 pp. 81-96)....................................Heilman, R.E.
9. Working Capital for Rate Making Purposes....... (Journal of Accountancy, Nov. 1918, pp.340-2)..Mann, Olaf A.
10. Relations of Engineer and Accountant in Public-Utility Development (Electric Railway Journal, Oct. 7, '22, pp. 13-4)..........................Keale, P. J.
11. Municipal Ownership of Public Utilities (Journal of Accountancy, Feb. '16. pp.146-9)...Walton,Seymour
12. Financing Public Utilities under State Control (Gas Record, Vol. 9.,pp. 356-7)........Wilson, C. P.

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